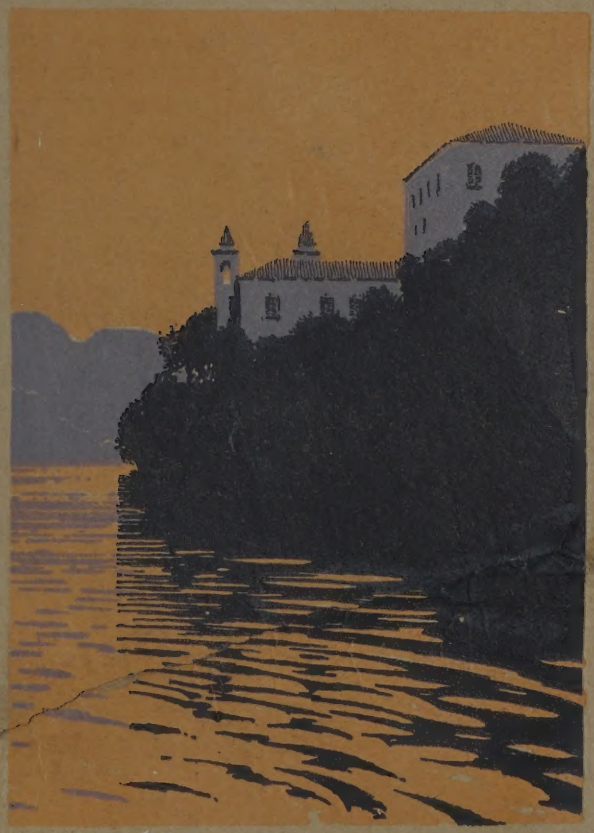
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Vol. 34 -
Jan - June 1921 -

THE ARCHITECTURAL FORUM



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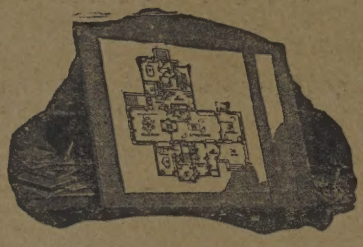
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AN ILLUSTRATED ARCHITECTURAL MONTHLY DEVOTED TO THE ART, SCIENCE AND BUSINESS OF BUILDING

ROGERS AND MANSON COMPANY, Publishers

NEW YORK BOSTON CHICAGO

INDEX TO VOLUME XXXIV JANUARY TO JUNE INCLUSIVE, 1921

Index to Plate Illustrations According to Subject

Plates numbered 1–16, January; 17–32, February; 33–48, March; 49–63, April; 64–78, May; 79–94, June

PUBLIC BUILDINGS

Title, Location and Architect — Plate No.

ADMINISTRATION AND GOVERNMENTAL

Connecticut State Library and Supreme Court House, Hartford, Conn., Donn Barber — 53–55
Fire Station, Branch, Salem, Mass., Frank S. Wheearty — 15
Industrial Laboratory, United States Bureau of Standards, Washington, D. C., Donn & Deming — 6, 7
United States Army Supply Base, Brooklyn, N. Y., Cass Gilbert — 8

BUSINESS AND COMMERCIAL

Brunswick Shoppe, The, Hotel Brunswick, Boston, Mass., Blackall, Clapp & Whittemore — 59
Cadillac Motor Car Co., Sales & Service Building, Detroit, Mich., Albert Kahn — 79
Ford Motor Co., Sales Building, New York, N. Y., Albert Kahn — 80, 81
Hartford Times Building, Hartford, Conn., Donn Barber — 49–51
Jackson Mills, Buildings for, Nashua, N. H., Lockwood, Greene & Co., Engineers — 10, 11
Liberty National Bank, Washington, D. C., Holmes & Winslow — 56, 57
New England Power Company, Office Building of the, Worcester, Mass., John Barnard — 14
Schwinn Building, The, Chicago, Ill., Walter W. Ahlschlager — 9
Soda and Candy Shop, Brookline, Mass., James Charles Flaherty — 58
Travelers Insurance Co., Hartford, Conn., Donn Barber — 52
Weber Motor Car Co., Building for the, St. Louis, Mo., Preston J. Bradshaw — 27
Whittemore, C. C., Building for, Boston, Mass., Allen & Collens and J. Lawrence Berry — 28

EDUCATIONAL BUILDINGS

DORMITORIES

Addition to Dormitory Quadrangle, Wellesley College, Wellesley, Mass., J. A. Schweinfurth — 40, 41

SCHOOLS

Elementary, for U. S. Housing Corporation, Quincy, Mass., McLaughlin & Burr — 12, 13
Girls' School and Lower School, Milton Academy, Milton, Mass., George F. Shepard — 85–87
Jefferson, Syracuse, N. Y., James A. Randall — 29
Smith, Edward, Syracuse, N. Y., James A. Randall — 30
Tower Hill, Wilmington, Del., Brown & Whiteside — 17–20

RELIGIOUS BUILDINGS

CHAPEL

Gate and Chapel, Tod Homestead Cemetery, Youngstown, Ohio, J. A. Schweinfurth — 42, 43

CLUB HOUSES

Chester, Chester, Pa., Clarence W. Brazer — 47, 48

ARCHITECTURAL DESIGN AND DECORATION

Breakfast Room, House on Long Island, N. Y., Trowbridge & Ackerman — 75
Dining Room, House of Mrs. Willard D. Straight, New York, N. Y., Delano & Aldrich — 63
Dining Room, House at Oyster Bay, L. I., N. Y., Delano & Aldrich — 76

Title, Location and Architect — Plate No

Library, House of A. L. Searle, Esq., Minneapolis, Minn., Trowbridge & Ackerman — 62
Living Room Mantel, House of James A. Burden, Esq., Syosset, L. I., N. Y., Delano & Aldrich — 94
Tap Room in Old Tavern, Danbury, Conn. — 93

MEMORIALS

Amphitheater, Arlington, Va., Carrère & Hastings — 33–36
Morgan, John Pierpont, Tablet to, Metropolitan Museum of Art, New York, N.Y., Paul Manship, Sculptor — 21

RESIDENTIAL BUILDINGS

APARTMENTS

Pondfield Court, Bronxville, N. Y., Harry Leslie Walker — 91

CITY HOUSES

Everett, A. Leo, Esq., 70th Street, New York, N. Y., Walker & Gillette — 31, 32
Norwood Gardens, Queensboro, N. Y., Walter Hopkins and Philip Resnyk — 44

COUNTRY AND SUBURBAN

Barber, Philip P., Esq., Tenafly, N. J., R. C. Hunter & Bro. — 16
Bliss, Mrs. William H., Montecito, Calif., Carleton Monroe Winslow — 1–5
Crane, Rev. William M., Richmond, Mass., Kilham & Hopkins — 25, 26
Forster, C. A., Esq., Cleveland, Ohio, Howell & Thomas — 72
Fulkerson, Dr. Lynn, Fieldston, N. Y., Dwight James Baum — 73, 74, 77, 78
Langley, R. W., Esq., New Haven, Conn., C. F. Townsend — 46
New Rochelle, N. Y., House at, C. A. Patterson — 92
Nichols, Fred, Esq., Cleveland, Ohio, Howell & Thomas — 67, 68
Pack, R. G., Esq., Cleveland, Ohio, Howell & Thomas — 66
Scofield, Mrs. W. C., Cleveland, Ohio, Howell & Thomas — 70
Sheldon, Allan, Esq., Detroit, Mich., Stratton & Snyder — 88
Smith, Fred B., Esq., Baldwin, L. I., N. Y., Fred B. Smith — 60, 61
Stewart, Gordon, Esq., Whitestone Landing, N. Y., Frank J. Forster — 64, 65
White, Roland W., Esq., Cleveland, Ohio, Howell & Thomas — 71
White, Thomas, Esq., Cleveland, Ohio, Howell & Thomas — 69
Wilson, Ex-President Woodrow, Washington, D. C., Waddy B. Wood — 37–39

FARM AND ESTATE BUILDINGS

James, Arthur Curtiss, Esq., Newport, R. I., Grosvenor Atterbury and Stowe Phelps — 22–24
Superintendent's House, Amawalk Nurseries, Amawalk, N. Y., James C. Mackenzie, Jr. — 45

HOTELS

Somerset, Chicago, Ill., S. N. Crowen — 82–84

INDUSTRIAL HOUSING

Crompton, R. I., Development at, The Housing Company — 89
Newmarket, N. H., Development at, The Housing Company — 90

Index to Articles

Pages numbered 1–38, January; 39–76, February; 77–114, March; 115–152, April; 153–190, May; 191–228, June

Page

American Institute of Architects, Fifty-fourth Annual Convention of the, Washington, D. C. 153
*Architecture and the Automobile Industry, by Wirt C. Rowland 199
*Architectural Expression in Concrete, by Frank J. Helmle 11
*Arlington Memorial Amphitheater, The, Arlington, Va., Carrère & Hastings, Architects 91
*Bulfinch Church, The, Lancaster, Mass., by Rev. Charles A. Place 191
*"Casa Dorinda," A California Country House, Carleton Monroe Winslow, Architect 9
*Central Manufacturing District, Chicago, Ill., S. Scott Joy, Architect
Part I. General Features of Operation 123
Part II. Architectural and Construction Features ... 177
*Colonial Architecture of Mexico, Impressions of the, by Walter H. Kilham
Part I 39
Part II 85
*Early American Domestic Architecture.
V. The Sir William Johnson House, Fort Johnson, N. Y. Measured drawings by Wm. D. Foster and Lewis E. Welsh 47
*Early Southern Architecture, Details of Two Famous Mansions in Virginia. Drawings by Goddard M. White 139
*"Euclid Golf," Cleveland, Ohio, by Howard Dwight Smith, Howell & Thomas, Architects 165
*Farm Buildings of Arthur Curtiss James, Esq., Newport, R. I., by W. F. Anderson, Grosvenor Atterbury and Stowe Phelps, Associate Architects 55
*Furnishing of Community Buildings with Limited Funds, The Chester Club, Chester, Pa., Clarence W. Brazer, Architect 107
*Outdoor Exhibit at the Metropolitan Museum of Art, New York, N. Y., by Edward H. Putnam 121
Pediment of the Madison Square Presbyterian Church.
*Recent Work in Hartford, Conn., Some, Donn Barber, Architect 115
*Remodeled Colonial Dwelling, Interesting Rooms of a, Wm. J. Cherry, Architect 69
*School of Economical Type, An Efficient, by G. Houston Burr, McLaughlin & Burr, Architects 23
*Stores at Southern Pines, N. C., Group of, Aymar Embury II, Architect 227
*Tower Hill School, Wilmington, Del., Brown & Whiteside, Architects 45
*Villas of the Veneto, by Harold D. Eberlein and Robert B. C. M. Carrère.
Part I. The Villa Emo at Fanzola, Italy 1
Part II. Villa Cerato at Montecchio Precalcino, Italy 77
Part III. Villa Berchet, near Mestre, Italy 157

Page

DEPARTMENT OF BUSINESS AND FINANCE, C. STANLEY TAYLOR, ASSOCIATE EDITOR
Business Elements in an Architect's Office 31
Co-operative Apartment Development, Business Aspects of a Successful 109
Developing Constructive Force of the Architectural Profession 223
Fixed-Fee Building Contracts, Practical Results Under 224
Have We Reached the Turning Point? 147
Organization Which Renders a Complete Building Service, An 225
Owner's Duty to the Architect, The 71
Tax-Exemption, Results from 150

DEPARTMENT OF ENGINEERING, CHARLES A. WHITTEMORE, ASSOCIATE EDITOR
*Brick Wall, A New 212
*Steel Construction, by Charles L. Shedd, C.E.
Part I. General Considerations 129
Part II. Columns and Beams 183
Part III. Plate Girders and Column Bases 207
*Terra Cotta Roofing Tile, by Alfred Lo Cascio
Part I 59
Part II 97
Part III 187
Truss Design and Details, by Charles L. Shedd, C.E.
Part I. Heavy Wooden Trusses with Parallel Chords 29
Part II. Wooden Roof Trusses 63
Part III. The Scissors Truss 100
Warehouse, A Large Concrete, by R. E. Brigham 25
Wood Trusses, Calculations of Stresses in, by Milo S. Farwell 133

DEPARTMENT OF MINOR ARCHITECTURE
*Automobile Sales and Service Building, Preston J. Bradshaw, Architect 65
*City House Development of Greater New York, A, Walter Hopkins and Philip Resnyk, Associate Architects 103
*Country House Alteration, A, Lucian E. Smith, Architect 21
*Housing Developments in New England, Some Post-War, by Tyler Stewart Rogers, The Housing Company, Architects 213
*Small Store Design, Innovations in 135
Three Candy Shops, Boston, Mass.

DEPARTMENT OF DECORATION AND FURNITURE, JEANNE TAYLOR AND LELAND W. LYON, R.A., ASSOCIATE EDITORS
Architect's Control of Furniture and Decoration, The. 17
*Colonial Interiors, Authentic Precedent in 219
*Decorative Fabrics Following Original Designs 143
*Decorative Features in a Remodeled City House, Delano & Aldrich 175
*Industrial Arts Exhibit at the Metropolitan Museum, New York, N. Y. 67
Interior Decoration Commissions 105
*Mural Paintings for Minor Buildings 173

Articles marked (*) are illustrated

Subject Index to Illustrations in Letter Press

Pages numbered 1–38, January; 39–76, February; 77–114, March; 115–152, April; 153–190, May; 191–228, June

ARCHITECTURAL DESIGN AND DECORATION

Title, Location and Architect — Page

Decorative Fabrics, Silk Prints and Brocades 143–145
Dining Room of House in New Haven, Conn., Ewing & Chappell, Architects 20
Industrial Arts Exhibit at the Metropolitan Museum of Art, New York, N. Y. 67, 68
Interiors of Remodeled House, New York, N. Y., Delano & Aldrich, Architects 175, 176
Interiors of Remodeled House of E. M. Bull, Esq., Blooming Grove, N. Y., William J. Cherry, Architect 67, 70
Interiors of Old Tavern, Danbury, Conn. 219–222
Madison Square Presbyterian Church, Pediment, McKim, Mead & White, Architects 120–122
Mural Decoration in Oval Room, Residence of Mrs. Willard D. Straight, New York, N. Y., Delano & Aldrich, Architects 146
Mural Decorations in Greenwich House, New York, N. Y., Delano & Aldrich, Architects 174
Mural Panels of Seasons, Delano & Aldrich, Architects .. 173
View of the Industrial Arts Exhibit at the Metropolitan Museum of Art, New York, N. Y. 67

Subject Index to Illustrations in Letter Press—*Continued*

EARLY AMERICAN ARCHITECTURAL DETAILS

Title, Location and Architect — Page

Johnson, Sir Wm. House, Fort Johnson, N. Y. Measured drawings by Wm. D. Foster and Lewis E. Welsh. . . . 47–54
"Sabine Hall," Richmond County, Va. Measured drawings by Goddard M. White . . . 139, 141, 142
"Westover," James River, Va. Measured drawings by Goddard M. White . . . 139, 140

RENAISSANCE AND MODERN ARCHITECTURE

"Capillo Del Pocito" at Guadalupe Hidalgo, Mexico. . . . 88
Cathedral, Mexico City, Mexico . . . 40–42
Chapel at Amecameca . . . 39
City Hall and Cathedral, San Luis Potosi, Mexico . . . 44
Cotswold District, English Details from . . . 36
"La Colegiata" at Guadalupe Hidalgo, Mexico . . . 89
Mount Vernon, near Washington, D. C., Airplane View of 155
Old Church at Churubusco, Mexico . . . 90
Renaissance Palazzo, Venice, Italy . . . 189
Villa Berchet, The, near Mestre, Italy . . . 158–164
Villa Cerato at Montecchio Precalcino, Italy . . . 77–84
Villa Emo at Fanzola, Italy . . . 1–8

PUBLIC BUILDINGS

ADMINISTRATIVE AND GOVERNMENTAL

Connecticut State Library and Supreme Court Building, Hartford, Conn., Donn Barber . . . 115–117
United States Army Supply Base, Connecting Bridges, Brooklyn, N. Y., Cass Gilbert . . . 11
United States Army Supply Depot, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 124–126
United States Bureau of Standards Laboratory, Washington, D. C., Donn & Deming . . . 16
United States Cold Storage Building, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 127, 128

BUSINESS AND COMMERCIAL

Brunswick Shoppe, The, Hotel Brunswick, Boston, Mass., Blackall, Clapp & Whittemore . . . 138
Cadillac Motor Car Co., Sales & Service Building, Detroit, Mich., Albert Kahn . . . 205, 206
Chicago Junction Warehouse, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 182
Durant Building for General Motors Co., Detroit, Mich., Albert Kahn . . . 199
Ford Sales & Service Building, Detroit, Mich., Albert Kahn . . . 202, 204
Hartford Times Building, Hartford, Conn., Donn Barber . . . 118, 119
Hide & Leather Company Building, New York, N. Y., Thompson & Binger, Inc., Engineers . . . 15
395 Hudson Street Building, New York, N. Y., McKenzie, Voorhees & Gmelin . . . 25–27
Montgomery Ward & Company Warehouse, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 123
Northern Jobbing Co., Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 180
Packard Service and Garage Building, Chicago, Ill., Albert Kahn . . . 201
Packard Service Building, Detroit, Mich., Albert Kahn . . . 202, 203
Stores at Southern Pines, N. C., Aymar Embury II. . . 227
Store, 306 Boylston Street, Boston, Mass., William Chester Chase . . . 135–137
Tower and Power House, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 178, 179
Troco Nut Butter Co. Building, Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 181
Varick Building, New York, N. Y., Helmle & Corbett 12–14
Weber Motor Car Co., Sales and Service Building, St. Louis, Mo., Preston J. Bradshaw . . . 65, 66
Wilson & Co., Central Mfg. District, Chicago, Ill., S. Scott Joy . . . 180

EDUCATIONAL BUILDINGS

Title, Location and Architect — Page

SCHOOLS

Tower Hill, Wilmington, Del., Brown & Whiteside . . . 45, 46
United States Housing Corporation, Quincy, Mass., McLaughlin & Burr . . . 23, 24

RELIGIOUS BUILDINGS

CHURCH

First Church of Christ, Lancaster, Mass., Charles Bulfinch . . . 191–198

RESIDENTIAL BUILDINGS

APARTMENTS

Jackson Heights, L. I., N. Y., George H. Wells . . . 111–113

CITY HOUSES

Norwood Gardens, Queensboro, N. Y., Walter Hopkins and Philip Resnyk . . . 103, 104

COUNTRY AND SUBURBAN

Apeldoorn, Holland, A. H. Wegerif . . . 149
"Casa Dorinda," Carleton Monroe Winslow . . . 9, 10
"Euclid Golf," Eight Suburban Houses, Cleveland, Ohio, Howell & Thomas . . . 165–172
Montclair, N. J., Lucian E. Smith . . . 21, 22
Yonkers, N. Y., Arno Kolbe . . . 151

FARM AND ESTATE BUILDINGS

James, Arthur Curtiss, Esq., Newport, R. I., Grosvenor Atterbury and Stowe Phelps . . . 55–58

CLUB HOUSES

Chester, Chester, Pa., Clarence W. Brazer . . . 107, 108

MEMORIALS

Amphitheater, Arlington, Va., Carrère & Hastings . . . 91–96

INDUSTRIAL HOUSING

Crompton, R. I., The Housing Company . . . 218
Nashua, N. H., The Housing Company . . . 215
Newmarket, N. H., The Housing Company . . . 213, 214
West Fitchburg, Mass., The Housing Company . . . 216, 217

Index to Frontispieces

Month

Church of Our Lady of Pompeii, New York, N. Y., from pencil drawing by Harold R. Shurtleff . . . Jan.
Church Dome, Virgin del Carmen, San Luis Potosi, Mexico . . . Feb.
Church Tower, Mexico City, Mexico . . . Mar.
Tower of the Travelers Insurance Company, from the Connecticut River, Hartford, Conn., Donn Barber, Architect . . . April
The Casino, Villa Berchet, near Mestre, Italy . . . May
First Church of Christ, Lancaster, Mass., from the engraving on wood by R. Ruzicka . . . June

Editorial Comment

Page

What Does 1921 Promise for Architects? . . . 38
Architects and Organization . . . 76
Encouraging Home Building . . . 114
Calder Committee Report . . . 152
What Can Architects Do to Stimulate Building? . . . 190
The Young Man in the Profession . . . 228

Index to Plate and Page Illustrations According to Author

Architect	Address	Plate	Page
Ahlschlager, Walter W.,	Chicago, Ill	9	
Allen & Collens,	Boston, Mass	28	
Atterbury, Grosvenor,	New York, N. Y	22–24	55–58
Barber, Donn,	New York, N. Y	49–55	115–119
Barnard, John,	Boston, Mass	14	
Baum, Dwight James,	Riverdale-on-Hudson, N. Y	73, 74, 77, 78	
Berry, J. Lawrence,	Boston, Mass	28	
Blackall, Clapp & Whittemore,	Boston, Mass	59	138
Bradshaw, Preston J.,	St. Louis, Mo	27	65, 66
Brazer, Clarence W.,	New York, N. Y	47, 48	107, 108
Brown & Whiteside,	Wilmington, Del	17–20	45, 46
Carrère & Hastings,	New York, N. Y	33–36	91–96
Chase, William Chester,	Boston, Mass		135–137
Cherry, William John,	New York, N. Y		69, 70
Crowen, S. N.,	Chicago, Ill	82–84	
Delano & Aldrich,	New York, N. Y	63, 76, 94	146, 173–176
Donn & Deming,	Washington, D. C	6, 7	16
Embury, Aymar II,	New York, N. Y		227
Ewing & Chappell,	New York, N. Y		20
Flaherty, James Charles,	Boston, Mass	58	
Forster, Frank J.,	New York, N. Y	64, 65	
Gilbert, Cass.,	New York, N. Y	8	11
Helmle & Corbett,	Brooklyn, N. Y		12–14
Holmes & Winslow,	New York, N. Y	56, 57	
Hopkins, Walter,	New York, N. Y	44	103, 104
Housing Company, The,	Boston, Mass	89, 90	213–218
Howell & Thomas,	Cleveland, Ohio	66–72	165–172
Hunter, R. C. & Bro.,	New York, N. Y	16	
Joy, S. Scott,	Chicago, Ill	123–128	177–182
Kahn, Albert,	Detroit, Mich	79–81	199, 201–206
Kilham & Hopkins,	Boston, Mass.	25, 26	
Kolbe, Arno,	New York, N. Y		151
Lockwood, Greene & Co.,	Boston, Mass	10, 11	
Mackenzie, James C., Jr.,	New York, N. Y	45	
Manship, Paul,	New York, N. Y.	21	
McKenzie, Voorhees & Gmelin,	New York, N. Y		25–27
McKim, Mead & White,	New York, N. Y		120–122
McLaughlin & Burr,	Boston, Mass	12, 13	23, 24
Patterson, C. A.,	New York, N. Y	92	
Phelps, Stowe,	New York, N. Y.	22–24	55–58
Randall, James A.,	Syracuse, N. Y	29, 30	
Resnyk, Philip,	New York, N. Y.		103, 104
Schweinfurth, J. A.,	Boston, Mass	40–43	
Shepard, George F.,	Boston, Mass.	85–87	
Smith, Fred B.,	New York, N. Y.	60, 61	
Smith, Lucian E.,	New York, N. Y		21, 22
Stratton & Snyder,	Detroit, Mich.	88	
Thompson & Binger,	New York, N. Y		15
Townsend, C. F.,	New Haven, Conn	46	
Trowbridge & Ackerman,	New York, N. Y	62, 75	
Walker, Harry Leslie,	New York, N. Y	91	
Walker & Gillette,	New York, N. Y	31, 32	
Wegerif, A. H.,	Apeldoorn, Holland		149
Wells, George H.,	New York, N. Y		111–113
Whearty, Frank S.,	Salem, Mass.	15	
Winslow, Carleton Monroe,	Los Angeles, Calif	1–5	9, 10
Wood, Waddy B.,	Washington, D. C	37–39	



CHURCH OF OUR LADY OF POMPEII
NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The
ARCHITECTURAL
FORUM

VOLUME XXXIV JANUARY 1921 NUMBER 1

Villas of the Veneto

I. THE VILLA EMO AT FANZOLO

By HAROLD DONALDSON EBERLEIN AND ROBERT B. C. M. CARRÈRE

"The . . . fabric is at *Fanzolo*, a village in the *Trevigiano*, three miles distant from *Castelfranco*, belonging to the Magnificent Signor Leonardo Erno [sic]. The cellars, the granaries, the stables, and the other places belonging to a villa, are on each side of the master's house; and at the extremity of each of them is a dove house, which affords both profit to the master, and an ornament to the place; and to all which, one may go under cover; which is one of the principal things required in a villa, as has been before observed.

"Behind this fabric there is a square garden of eighty *campi trevigiani;* in the middle of which runs a little river, which makes the situation very delightful and beautiful. It has been adorned with paintings by Messer Battista Venetiano."

Book II, Chapter XIV, p. 50.

SUCH is Palladio's own description of the Villa Emo at Fanzolo, given from Isaac Ware's translation of the *Quattro Libri dell' Architettura*, published in London in 1738.

The villa in its present state differs somewhat in arrangement from the scheme set forth in Palladio's account. The wings, which Palladio designed to house the dependencies of the villa—the stables, the granaries, the cantine or storage place for wine, the hay lofts and all the other appropriate farming accommodations—were altered internally at an early date to make provision for a chapel and a large number of rooms for guests, besides servants' quarters. Externally no appreciable change was made in these parts of the fabric. A slight deviation from the original design occurs at the rear, where the steps descending from the great hall to the garden, instead of being in one straight run, divide into two flights running in opposite directions.

Otherwise the villa today is substantially as Palladio designed it to be. Apparently it is exactly the same; the word "substantially," however, is used advisedly because of certain variations between the measurements in the plans



Garden Front and Loggia of the Main Building



From a panchromatic photograph by Harold Donaldson Eberlein

The walls of the Loggia are enriched with fresco painting applied direct to the plaster and remain to-day in a remarkable state of preservation

SOUTH LOGGIA, VILLA EMO, FANZOLO, ITALY

and elevations, as designed by Palladio, and the measurements as actually executed.*

These departures from the architect's measurements are characteristic of all Italian buildings, as anyone familiar with the measuring of them is well aware. So universal is the phenomenon that Scamozzi, in his large edition of *The Buildings and Designs of Andrea Palladio*, appends a little table of these variations at the end of the description of each building. The master builders and their workmen presumably felt it their prerogative to take liberties with the measurements within certain limits. If they observed the spirit of the design, they assumed license to make minor variations in the letter as the work progressed.



Detail of Interior Fresco

The setting of the Villa Emo is exceedingly impressive. No site more ideal than Fanzolo could be imagined for the display of a stately Palladian structure to the fullest advantage. The great Trevisan plain, flat as a table, is bounded on the north by mountains that rise abruptly, affording a background of soft greens and blues. Against this foil stands forth in crisp relief the incisive, formally ordered contour of the villa, its buff body and white trim adding contrast of color to the already striking emphasis of its presence. Nothing could be more satisfying than the simplicity and dignity of the long façade viewed from the entrance. To the north, or rear, of the villa, a geometrically disposed park stretches

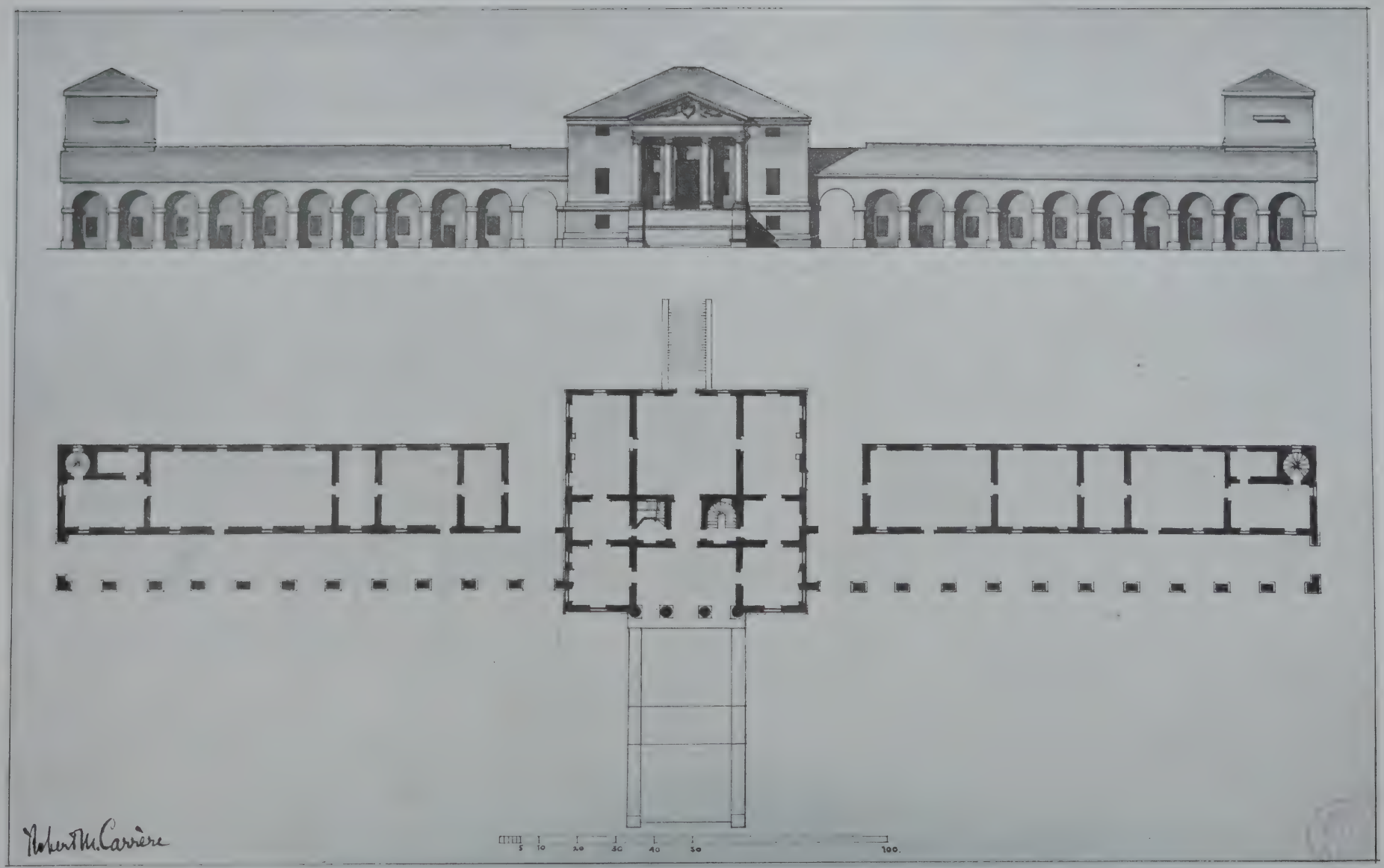
Palladio's Measurements	*As Executed*
Square great hall—27′	26′ 3″ x 26′ 7″
Length, large rooms—27′	26′ 7″
Width of wing loggias—15′	13′
Diameter of columns—2′ 6″	2′ 4½″
Height of columns—20′	19′ 4″
Entablature—4′	4′ 4″

The ground floor plan, the elevation, the capital detail and the entablature detail are given according to Scamozzi's measurements and are reckoned by the Vicenza foot. The other details are given according to the regular English foot.

The Vicenza foot equals 1′ 1¾″ or a small fraction more than 1/7 additional. By adding one-seventh to the measurement in Vicenza feet the equivalent is obtained in English feet.



Arcade on Garden Side of West Wing



SOUTH ELEVATION AND FIRST FLOOR PLAN OF MAIN BUILDING WITH GROUND FLOOR OF WINGS

Measured and Drawn by Robert B. C. M. Carrere

VILLA EMO, AT FANZOLO, ITALY. DESIGNED BY ANDREA PALLADIO



MAIN BUILDING FROM AXIS OF GARDEN



WEST WING AND MAIN BUILDING FROM THE GARDEN

VILLA EMO, FANZOLO, ITALY



Detail of Main Stairway

away in the distance. Of gardens, in the sense of the intimate enclosures to be found in so many other parts of Italy, there are none.

The structure is of brick coated with stucco and painted. The columns of the loggia have white stone bases and caps, while the shafts are of shaped brick coated with stucco and carefully smoothed with a *marmorino* finish. This is a common Palladian method of pillar construction, the bases being usually of stone and the caps either of stone or of moulded terra cotta painted.

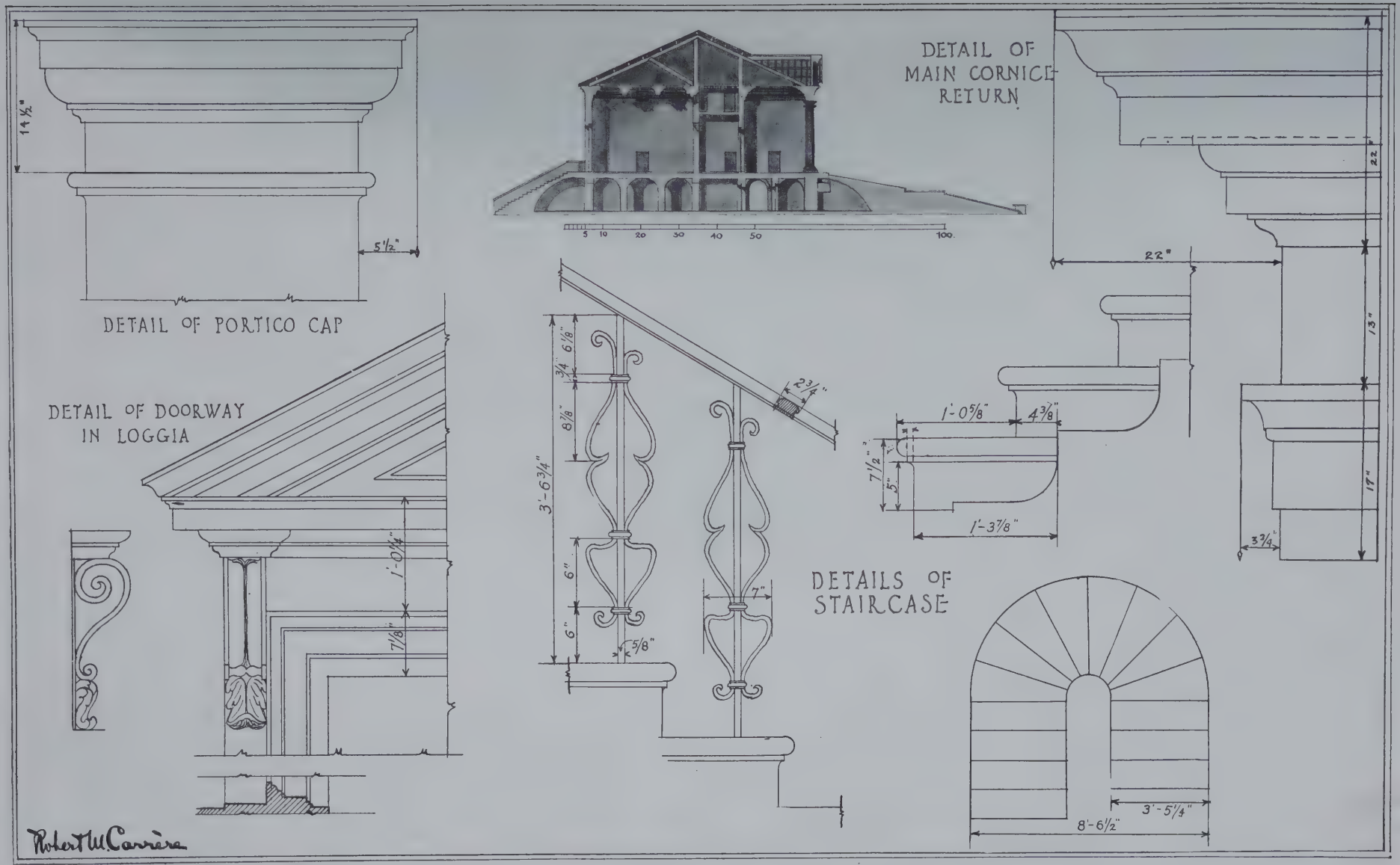
No matter what the materials with which he was often obliged to execute his work, Palladio succeeded in impressing the beholder with only the nobility of his design while the quality of the substance is lost sight of. His mastery in this particular calls to mind the words of Sir Henry Wotton upon viewing the entrance of Palladio's church at the Conventa della Carità in Venice: "Mine eye hath never beheld any columns more stately of stone or marble; for the bricks having been first formed in a circular mould, and then cut before their burning into four quarters or more, the sides afterwards join so closely, and the joints concentre so exactly, that the pillars appear one entire piece, shewing how in truth we want rather *art* than *stuff* to satisfy our greatest fancy." Such expedients were so usual in stucco loving Italy that we may seriously question whether Palladio was much disturbed by the lack of what some of us would be disposed to regard as more worthy materials.

In plan the villa consists of a central block, about 70 feet square (English measure), flanked by a long straight wing on each side. These are apparently one story in height but really contain both ground and first floors, as one may see from the rear, and in front of them are arcades. The rooms in the high basement of the central block are vaulted and here are kitchens, sculleries and other domestic offices, while above the lofty first floor, the capacious attic story contains sleeping rooms.

On the plan the arrangement of rooms shown is for the first floor of the central block, and for the ground floor of the wings. The plan of the interior discloses the wonted arrangement of a great hall with smaller rooms opening from the sides. The previous allusion to Palladio's nobility of design applies with equal propriety to the imposing proportions of all the rooms which impress one forcibly by their dimensions. The subject of Palladio's theories in this respect will be more fully dealt with in a subsequent paper. Save the very simple fire-



Dovecote at End of West Wing



SECTION THROUGH MAIN BUILDING AND GENERAL DETAILS

Measured and Drawn by Robert B. C. M. Carrere

VILLA EMO, AT FANZOLO, ITALY. DESIGNED BY ANDREA PALLADIO



View of North or Entrance Front

places, the interior boasts no features of architectural adornment. The great hall was designed with a beamed and coffered ceiling, with painted embellishment, but if this part of the design was ever carried out it was covered over by a flat vault of plaster.

In lieu of moulded door trim, cornices and other items of interior architectural amenity, the rooms of the first floor are fully adorned with frescoes which include, besides the pictorial subjects displayed upon the walls of the great hall and the two adjoining long rooms at the sides, a full complement of *painted architecture*—door trim, paneled dados, pilasters, cornices and the like—very cleverly executed. The small vaulted rooms next the stairways, and the vaulted passage from the door to the great hall, are covered with arabesques after the manner of Giulio Romano.

The Messer Battista Venetiano whom Palladio credits with the painting was Giovanni Battista Farinati, sometimes called Battista Zelotti and also Battista da Verona. Battista was responsible only in part for the work and wrought as assistant to Paolo Veronese, to whom the commission had been entrusted. Upon the strength of Paolo's authenticated authorship of the frescoes, the Villa Emo has been declared a national monument.

The staircases in the Villa Emo, as in so many of Palladio's villas, are good but inconspicuous. The staircase was still, to a great extent, a utilitarian feature to be treated, it is true, with due consideration and planned for comfort and convenience, but to be kept more or less in the background and not made the vehicle of important design in a prominent position. Palladio did, as we know, design some wonderful staircases, and the treatment of the staircase, by his own testimony, was a subject in which he was deeply interested and which he deemed worthy of the utmost consideration on the score of design. It was chiefly left, however, to the architects of a later generation—especially the masters who worked in the baroque style—to develop the magnificent staircase in the villas and palaces of Italy.

If we are tempted to criticise unfavorably the lack of domestic quality in the villas of the Veneto as compared, for example, with the villas of Tuscany, or to condemn the placing of farming dependencies close to the master's quarters, we must remember two things: First, the villa was usually the center of a great agricultural estate, and it was the ancient custom of the land to concentrate all the farming activities under the eye of the master or his bailiff. Second, so far as the villas belonging to the Venetian nobility were concerned, they were usually occupied by their masters only a small part of the year. Palladio draws an alluring picture of country life when he writes:

"The city houses are certainly of great splendour and conveniency to a gentleman who is to reside in them all the time he shall require for the administration of the republic, or for directing his own affairs. But perhaps he will not reap much less utility and consolation from the country house; where the remaining part of the time will be passed in seeing and adorning his possessions, and by industry and the art of agriculture, improving his estate; where also by the exercise which in a villa is commonly taken, on foot and on horseback, the body will the more easily preserve its strength and health; and, finally, where the mind, fatigued by the agitations of the city, will be greatly restored and comforted, and be able quietly to attend the studies of letters, and contemplation.

"Hence it was the antient sages commonly used to retire to such like places; where being oftentimes visited by their virtuous friends and relations, having houses, gardens, fountains, and such like pleasant places, and above all, their virtue, they could easily attain to as much happiness as can be attained here below."

As a matter of fact, however, "the administration of the republic" and "the agitations of the city" engrossed most of the noble Venetians' time, and if they spent as much as six weeks or two months of the year at their villas they were giving their "virtuous friends and relations" a good opportunity to come and visit them there. Under such brief occupancy, therefore, the atmosphere of domesticity did not assert itself to the utmost. This fact we must accept and be content to admire Palladio's villas as superb pieces of composition.



MAIN ENTRANCE DETAIL

HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIFORNIA

CARLETON MONROE WINSLOW, ARCHITECT



SERVICE WING FROM FORECOURT



SERVICE WING AND MAIN FRONT

HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIFORNIA

CARLETON MONROE WINSLOW, ARCHITECT



TERRACE FRONT FROM THE SOUTHEAST



VIEW IN PATIO TOWARD TERRACE

HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIFORNIA

CARLETON MONROE WINSLOW, ARCHITECT

SOUTHWEST WINDOWS AND STEPS TO TERRACE

HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIFORNIA

CARLETON MONROE WINSLOW, ARCHITECT



DETAIL OF MUSIC ROOM



DINING ROOM DOORS FROM LONG HALL

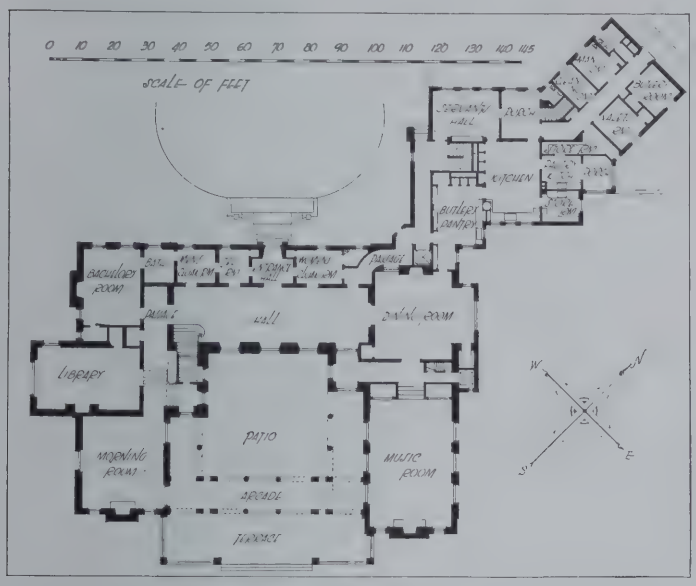
HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIFORNIA

CARLETON MONROE WINSLOW, ARCHITECT

"Casa Dorinda," a California Country House

CARLETON MONROE WINSLOW, ARCHITECT

MANY interesting possibilities attend the development of a large and important country place in Southern California where extensive grounds include a primeval growth of live oaks and where the various buildings are to be sufficiently ample for an adequate interpretation of the type of architecture which is best adapted to the locality. An unusual opportunity, therefore, was presented in the planning of the California home of Mrs. William H. Bliss at Montecito, near Santa Barbara, and the architect, Carleton Monroe Winslow of Los Angeles, has made wise use of unusual possibilities.



Plan of Main Floor

At the main entrance from the public road the grounds are screened by a high stucco wall. A gate lodge stands just within the gates and the red Spanish tiles of its low pitched roof are visible over the stucco walls. Within the grounds the driveway crosses masonry bridges over several "arroyos" or little streams and ends in a broad sweep before the residence itself. The house which is the center of this important estate is a large rambling structure designed in a highly developed version of what has come to be known popularly as the Spanish mission style with an interesting arrangement of large apartments grouped about a patio—a type of building which has always been identified with the development of this region and which is particularly well suited to the climate of California.

The effect, to a visitor, is that of a picturesquely disposed country place which might have been the result of gradual growth or development during a long period. Much of the appearance of age has been given the house by the use of antique gates and grilles of wrought iron from an old church in Mexico and by the presence of many old live oaks. The entrance façade is a broad expanse of brick masonry covered with buff stucco with many small windows screened with iron grilles to the right and left of the main doorway, the door itself being of oak studded with old Spanish nail heads. Above there are five large windows which open from a loggia, these windows and the main doorway being adorned with richly sculptured decoration carved from Boise sandstone of a warm gray which affords an interesting contrast with the buff, rough surfaced stucco of the walls.

The opposite side of the house, facing toward the south, is planned with a broad terrace upon which open the arches across one side of the patio. These arches are filled in with wrought ironwork, many of the grilles being from old buildings and others made by present day craftsmen from the old patterns.

The interior arrangement of the house fulfills the promise made by the exterior for it presents a number of large, dignified rooms placed, in Spanish fashion, about a central courtyard which is floored with square paving quarries. The interior treatment, as will be seen from the illustrations, is exceedingly simple. Walls, for the most part, are of slightly roughened plaster, painted, and some

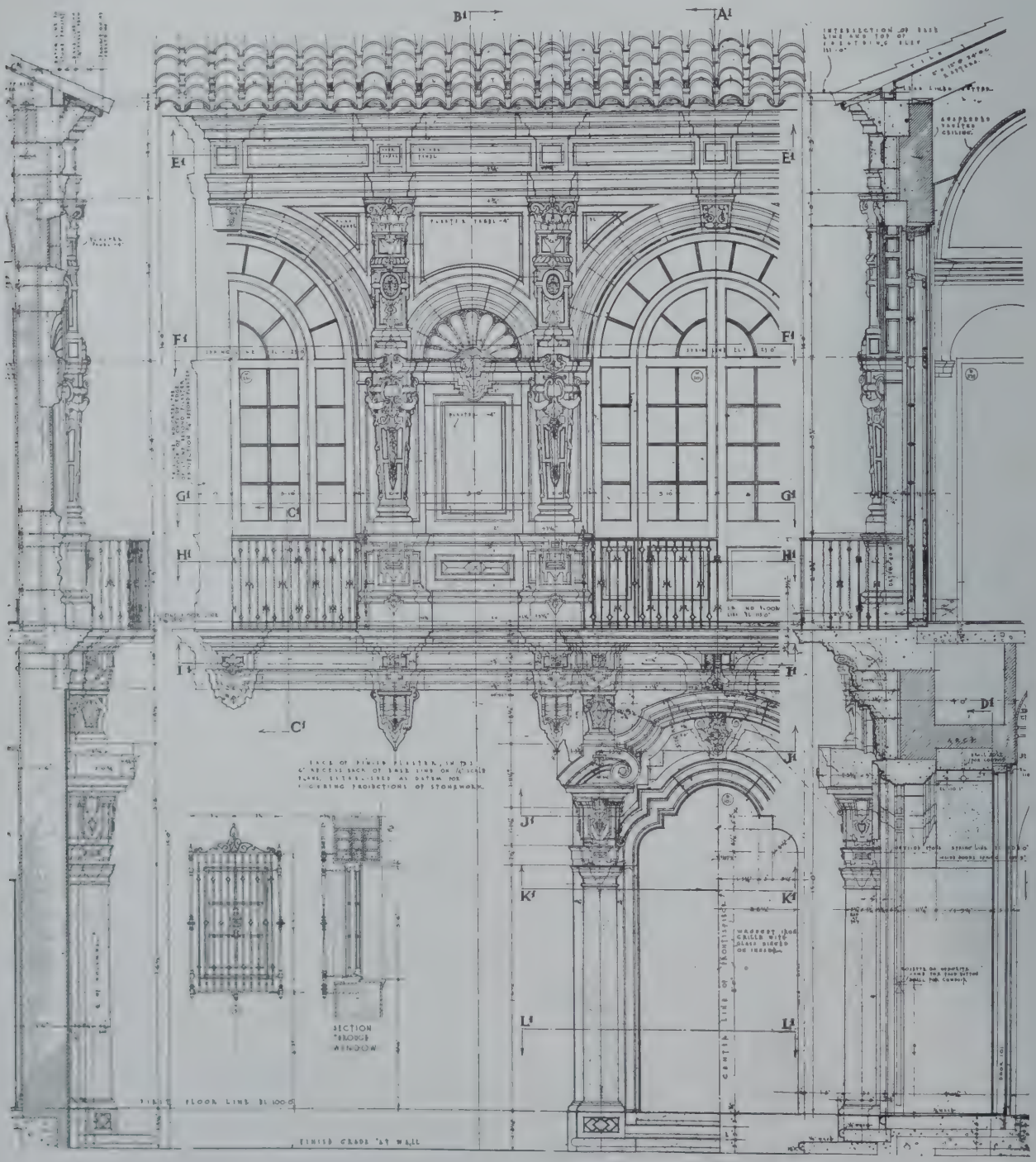


Baroque Mantel in Music Room

of the ceilings are vaulted while others show the use of wooden beams. Most of the woodwork throughout the house is of American walnut.

From the tower is had a view such as only California could offer with vineyards, villages and mountains spread out in panoramic form. To reach the tower an elevator is provided, the shaft being hidden by the low gable at one corner of the tower which may be seen in one of the illustrations.

A great part of the success of this house is due to the careful selection of materials. Care was taken to choose stone and stucco for the exterior which produced the effect which the architect meant to create and roofing tile was specially burned to give the color and texture of old weathered tiles. Ironwork plays an important part in Spanish architecture and in this instance much has been used, suitably austere or elaborate as its purpose seemed to demand. Equal care has been given to the details of the interior and such accessories as lighting fitments and grilles of wood and metal and such details as the laying of floors have received careful study, and the result is seen in their harmonious fitting into their surroundings.



Detail of Entrance Doorway and Central Feature of Main Front

Architectural Expression in Concrete

By FRANK J. HELMLE

IN this article Mr. Helmle states some of the fundamental principles underlying the development of architectural design suited to reinforced concrete construction. He is a member of the firm of Helmle & Corbett, architects of the Varick Building illustrated herewith, which is notable as an example of design in concrete. The plates following illustrate other recent buildings and on page 37 will be found brief descriptions of them. In a later issue we will present an article describing interesting industrial work in concrete of Lockwood, Greene & Co., Architects and Engineers. — THE EDITORS

RECENT years have seen a constantly widening field for the development of architecture; the greatest evidence of this is no doubt in industrial building and in meeting the special demands which this type of work imposes upon the architect there is presented an opportunity to not only devise new forms of architecture but to greatly increase the power and prestige of the profession if the real character of the conditions is recognized and an honest, straightforward solution sought.

It has been proved beyond question that there are definite advantages accruing to any manufacturer who has the foresight to erect buildings of good architectural design that will be a stimulus to the pride of local citizens and a satisfaction to the workers employed in the buildings. It has likewise been definitely proved in many cases that no large additional expense is involved when an industrial building is given an architectural value by means of a well considered scheme in which the architecture is supplied by good proportions and massing of the structural features.

The particular opportunity that the industrial building presents to architects is the development of a form of architectural expression that will be in accord with the characteristics of special materials and types of construction that are well suited, from the standpoint of service and economy in both first cost and maintenance, to industrial buildings.

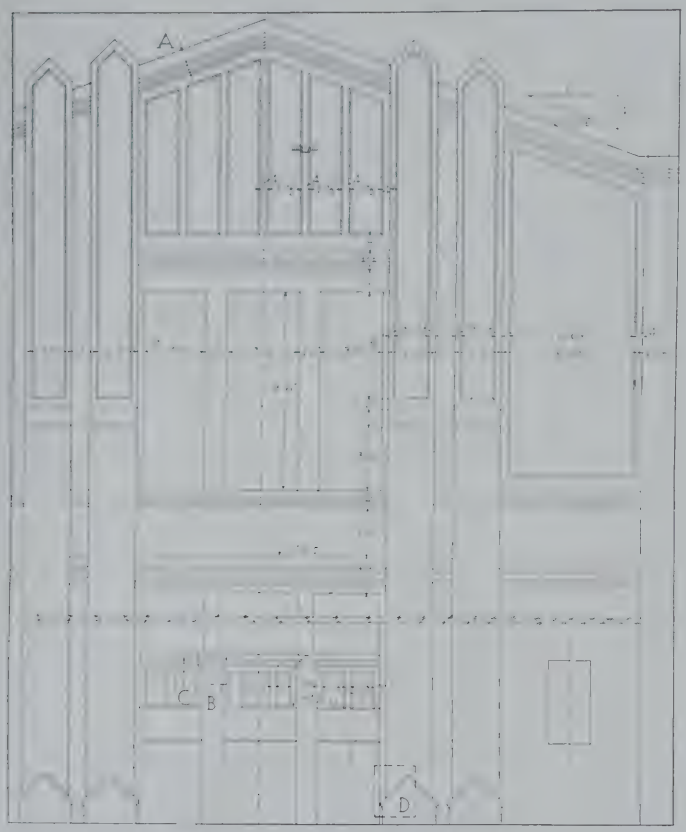
Of the types of construction suited to industrial buildings there is probably none better than reinforced concrete. The development of this form of construction has been rapid in spite of a great many handicaps placed in its way, but its now well recognized advantages of permitting speed in construction, use of low priced labor, fireproofness, low maintenance costs and its adaptability to the varying conditions of industrial requirements have made it a factor that must be recognized by architects in designing not only factories but loft buildings and many other types where large floor space must be provided at a low cost.

Ever since it passed the experimental stage reinforced concrete has been valuable as an economical material. Just before the war the margin in its favor as against structural steel fireproofed was hardly more than 10 or 15 per cent of the cost of the structural frame of the building, or about 5 per cent of the total cost of the structure. Early in 1920 this margin had risen to approximately 40 per cent of the cost of the structural frame due, of course, to the excessive cost of structural steel, and the margin at the present time is about 25 per cent.

Economy in construction through the use of concrete is not the least of its advantages; it is readily adapted to the varying requirements of plan and does not impose such rigid conditions as many suppose. The usual size of bay in a concrete building is 20 x 20. Smaller bays down to say 16 x 16 would be a little more



Detail of Connecting Bridges at U. S. Army Supply Base, Brooklyn, N. Y. All Detail in Structural Concrete
Cass Gilbert, Architect



Detail of Upper Stories, Varick Building

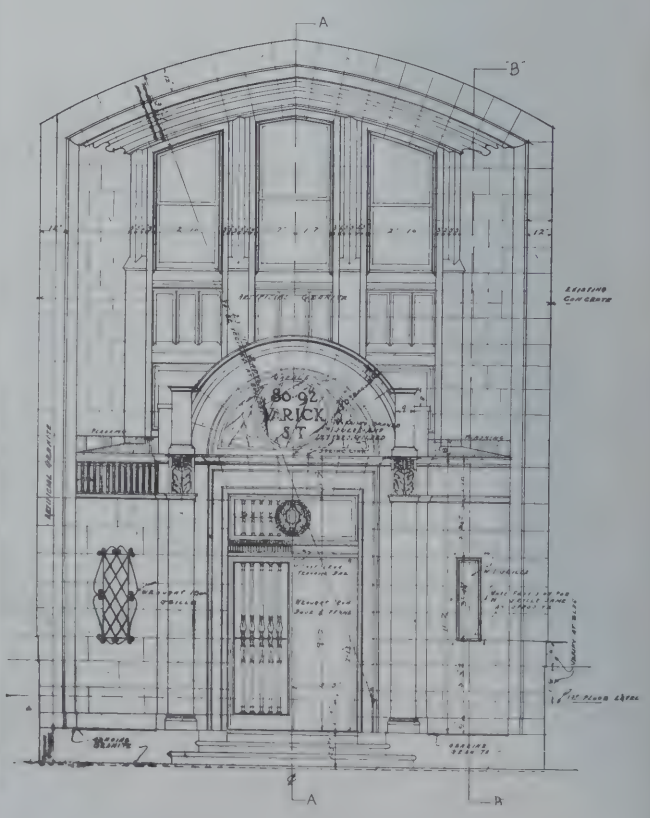


Construction Progress View of Varick Building
Helmle & Corbett, Architects

economical, but the saving is so slight that as a rule the usefulness of the building with 20-foot bays is enough greater to warrant the slight additional cost. Bays can, of course, be made considerably larger than 20 x 20 if the use to which the building is to be put requires it.

One of the objections long brought to the use of concrete in structures of more than a few stories has been the fact that it was thought necessary to make reinforced concrete columns in the lower stories of great size. While it is true that the size of a reinforced concrete column increases with the increase of load to be carried more rapidly than does the size of a steel column, this increase is not detrimental except in rare instances. A reinforced concrete column in the first story of a 12-story building having 18-foot spans in both directions and designed to carry live loads of 150 pounds per square foot would be a round column 30 inches in diameter. If for some special reason it would be necessary to make the columns in the lower stories smaller than this, structural steel cores could be used at a comparatively small additional expense. This would use up only a small part of the saving effected by the use of reinforced concrete for the rest of the structural members.

It sometimes happens that it is necessary

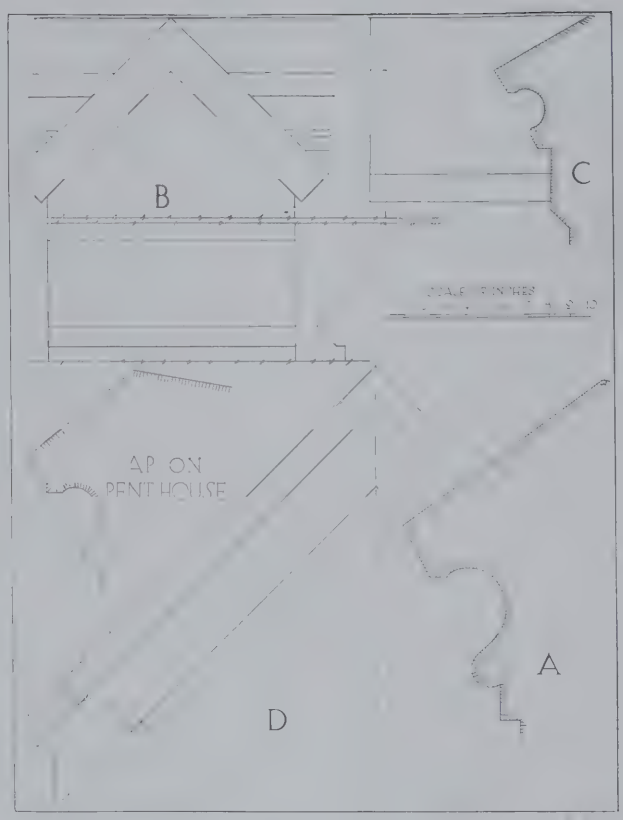


Entrance Detail in Artificial Granite

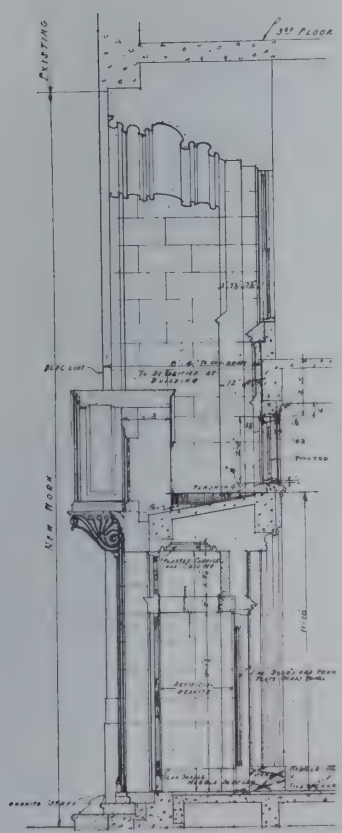
to construct a long span girder in a building carrying a heavy load. The most common cause for this in industrial buildings is the existence of railroad tracks on the ground floor which disturb the column spacing on that floor and over which girders have to be constructed to carry the regularly spaced columns in the stories above. Sometimes reinforced concrete can be used for these girders, but in cases of extreme loads where headroom is limited, steel plate girders carried on steel columns can be introduced without affecting the economy of the surrounding reinforced concrete structure.

There are three types of floor construction in more or less frequent use: the beam and girder type, the flat slab type and the method which involves the combination of hollow tile and concrete. Each of these types has certain advantages that best fit it to particular conditions.

The beam and girder type is one of the early methods of floor construction and has simplicity to recommend it. The newer form flat slab construction has a number of advantages over it and in cases where flat ceilings or where the greatest number of stories are wanted in a given height it is invariably used. The flat slab construction occupies much less vertical height for floors owing to the absence of girders and beams and it also requires the minimum number of sprinkler heads.



Detail of Concrete Buttresses and Mouldings



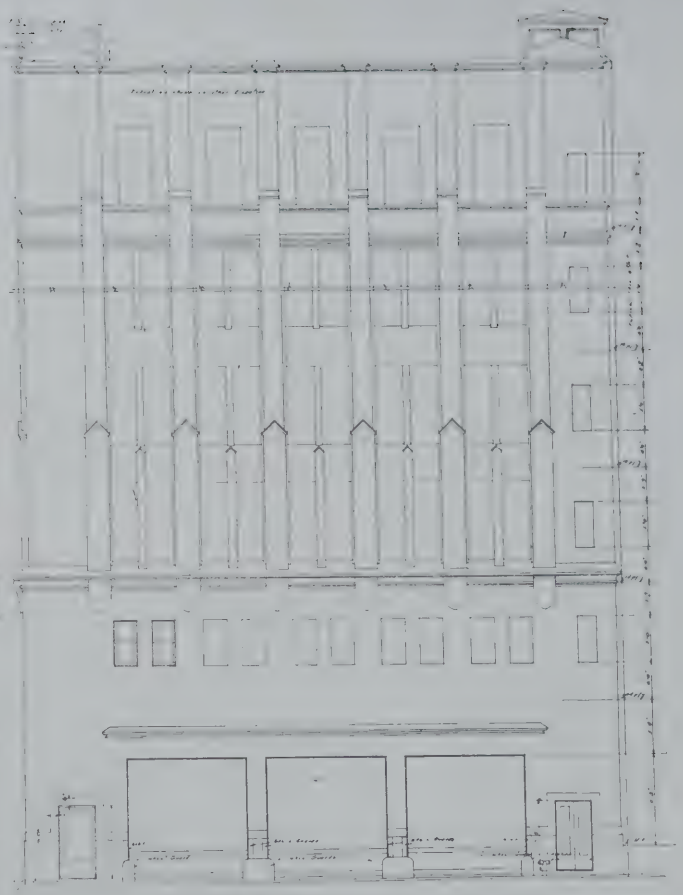
Section through Entrance



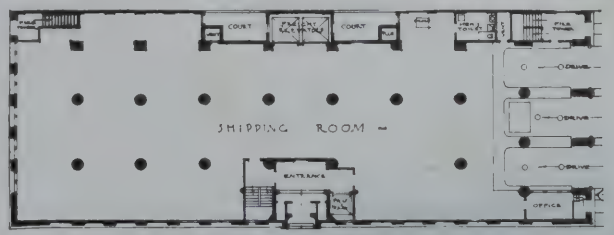
Perspective of Completed Varick Building
Helmle & Corbett, Architects



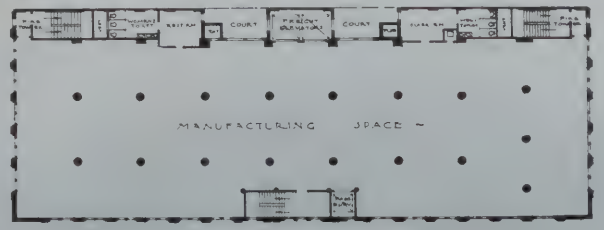
PORTION OF FRONT ELEVATION



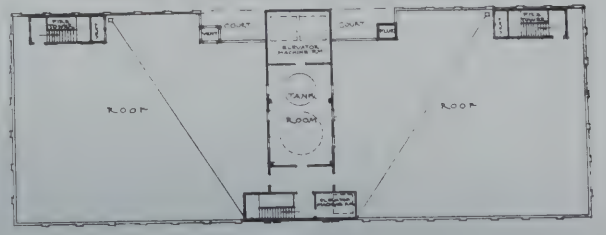
PORTION OF SHIPPING END ELEVATION



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN



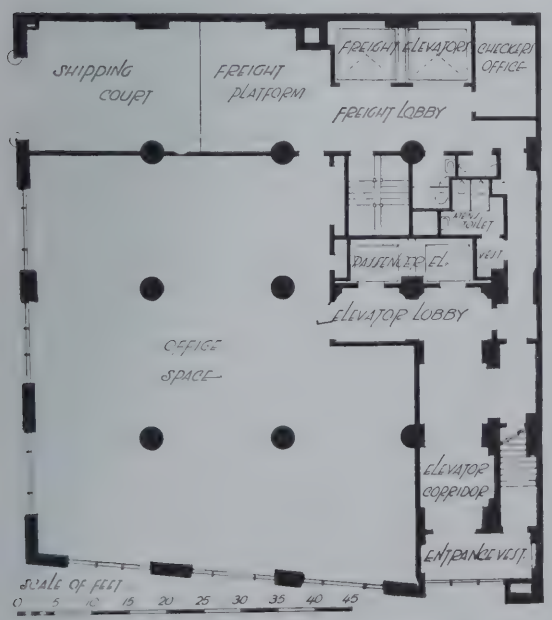
ROOF PLAN

VARICK BUILDING, NEW YORK, N. Y. (All Concrete Construction)
HELMLE & CORBETT, ARCHITECTS

There is little precedent which we may follow in designing concrete structures. In the case of any building it is supposed that it has a definite purpose and it is the architect's duty to interpret this purpose through his design and in conformity with the character of the materials in which it is executed. In designing a concrete building in which the architecture will be had by means of pleasing forms of the structural parts there is demanded of the architect a full knowledge of the physical properties of the material and the practical and economical methods of construction which are employed in using it.

Architectural treatment and ornamental detail should be carefully considered on any building. Most of our buildings are very much over decorated. Simplicity should be the watchword in architecture. If architects designing in concrete would give a little thought to proportion in their design, we would have some very creditable buildings in this material. The architectural treatment best adapted to reinforced concrete is that which depends upon broad lines and proportions rather than upon fine detail. It is almost impossible to obtain in reinforced concrete which is cast in place on a building the absolute perfection of texture and alignment which can be obtained with cut stone or brick. Such excellence of workmanship can, however, be obtained as is required by the great majority of buildings. In designing mouldings and cornices it must be remembered that these are constructed in most cases from wood forms and their character should be of the simplest so that the construction of the form work may be handled without great expense or difficulty. The variety of mouldings should be kept to the absolute minimum because the construction of many differing forms becomes an expensive item. Moulding sec-

In this 17-story, all-concrete building a feature has been made of the treatment of the surface of the lower floors giving them the appearance of granite. Expanded metal with the smallest available mesh is wired to the outside surface of the steel. In the two inches between this mesh and the form is placed ¼-inch aggregate of pink and white quartz, feldspar and olivine, mixed one part of white cement to two of aggregate. After it had been built up to a height of two feet the balance of the form was filled with common structural aggregate. There was immediate fusion and perfect bond but it was necessary to keep the outside concrete about one foot higher than the structural concrete to prevent mixing. After the forms have been stripped, the surface is patched where necessary, washed with white cement, and then allowed to stand, when it is bush hammered to give the completed granite appearance. The remainder of the building is surfaced with electric surfacing machines and coated with a waterproofing compound providing a uniform color.



First Floor Plan



Perspective View

Concrete Building for Hide and Leather Realty Company, New York, N. Y.

Thompson & Binger, Inc., Engineers



Testing Room in Central Wing of Bureau of Standards Industrial Laboratory

tions should also be designed so that the forms can readily be removed after the concrete is set without doing damage to the finished work. Full use should be made of simple forms of ornament such as recessed panels which are easily had by slightly increasing the thickness of the forms where such a panel is desired.

The manufacture of pre-cast ornament has been well developed and competes, in many cases, with terra cotta. It is not often that pre-cast ornamentation competes with structural ornament for the reason that where the detail of the ornamentation is such that satisfactory results can be obtained by casting in place, this method is much cheaper. The pre-cast method of construction is called upon when the fineness of the detail is such that satisfactory results could not be obtained by casting in place in wood forms.

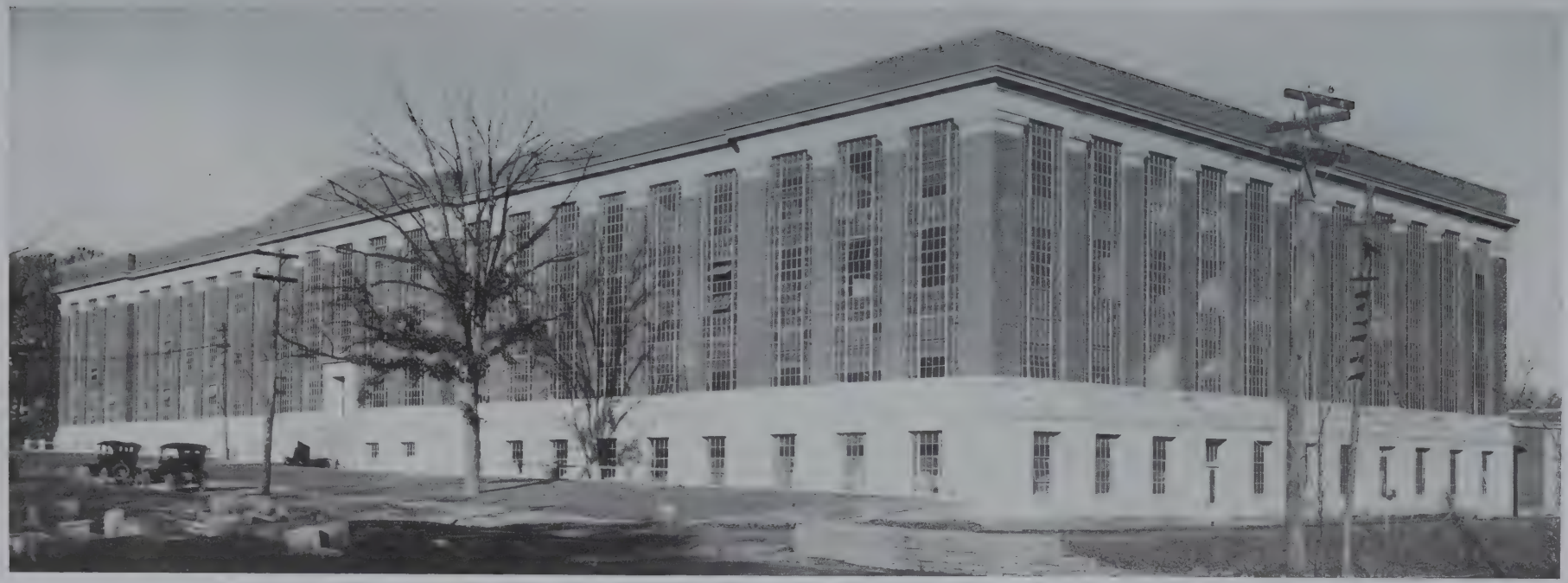
There are no advantages from the standpoint of economy in combining other materials such as brick, terra cotta or tile with concrete. Concrete is always the cheapest. From the point of view of architectural effect, however, there are often excellent reasons for combining other materials with concrete and there are endless possibilities in this direction. Efforts to provide finish of surface by varying the composition of the concrete, using one mixture for the facing and another for the body of the walls, have not as a rule been successful. It has seldom proved practicable to use a different aggregate for the exterior surface of concrete work from the aggregate used for the body of the walls. In the case of a building where there is a considerable amount of reinforcement two inches from the surface and where there are many corners and angles the attempt to use two different kinds of aggregate seriously impedes the progress of the work and greatly adds to the expense.

The usual type of surface treatment at the present time is rubbing, with or without the application of a coating on the rubbed surface. Hammering of surfaces is not usual except for small areas for architectural effect. Rubbing costs about 10 cents per square foot, coating 5 cents and hammering 20.

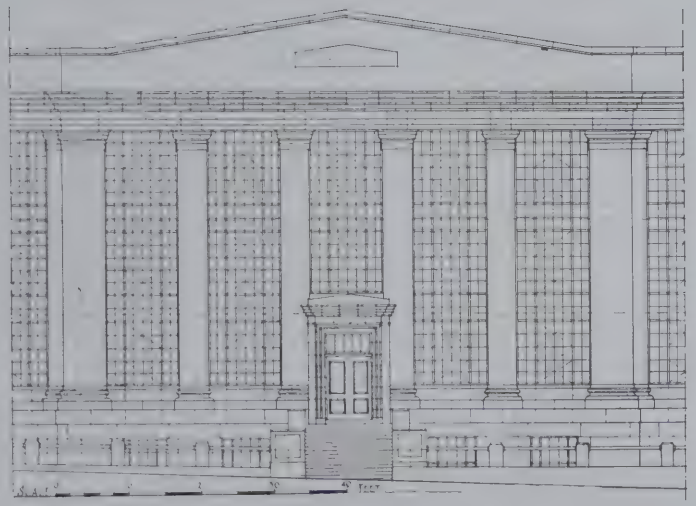


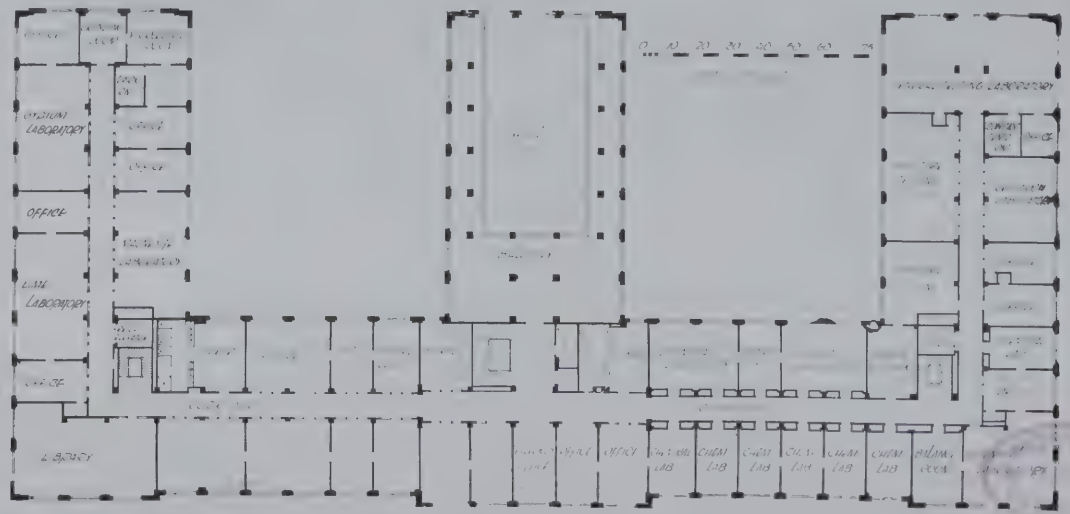
Construction Progress View of Bureau of Standards Laboratory Showing Concrete Frame Completed and Brick and Stone Facing Being Applied

Donn & Deming, Architects



GENERAL VIEW



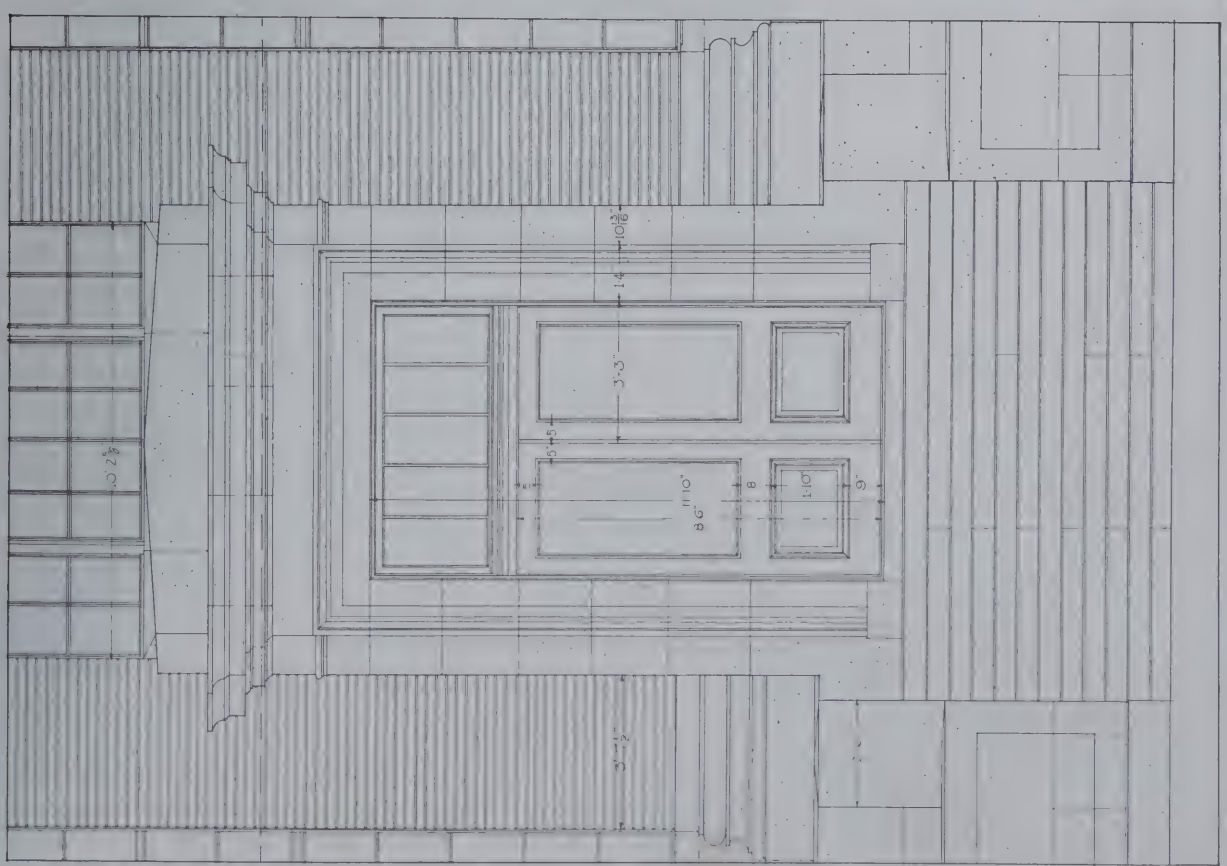


DETAIL OF CENTRAL BAY AND SECOND FLOOR PLAN

INDUSTRIAL LABORATORY, U. S. BUREAU OF STANDARDS, WASHINGTON, D. C.

DONN & DEMING, ARCHITECTS





DETAIL OF DOORWAY AND END BAY

INDUSTRIAL LABORATORY, U. S. BUREAU OF STANDARDS, WASHINGTON, D. C.

DONN & DEMING, ARCHITECTS



ADMINISTRATION BUILDING AND WAREHOUSE "A"



DETAIL IN COURT BETWEEN WAREHOUSES

U. S. ARMY SUPPLY BASE, BROOKLYN, N. Y.

CASS GILBERT, ARCHITECT



GENERAL VIEW

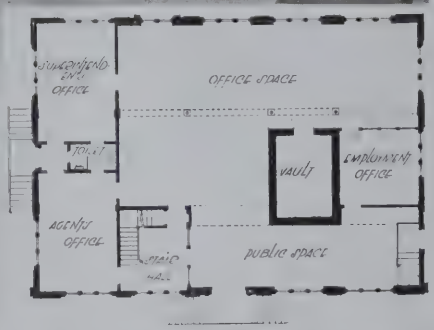


MAIN ENTRANCE DOORWAY

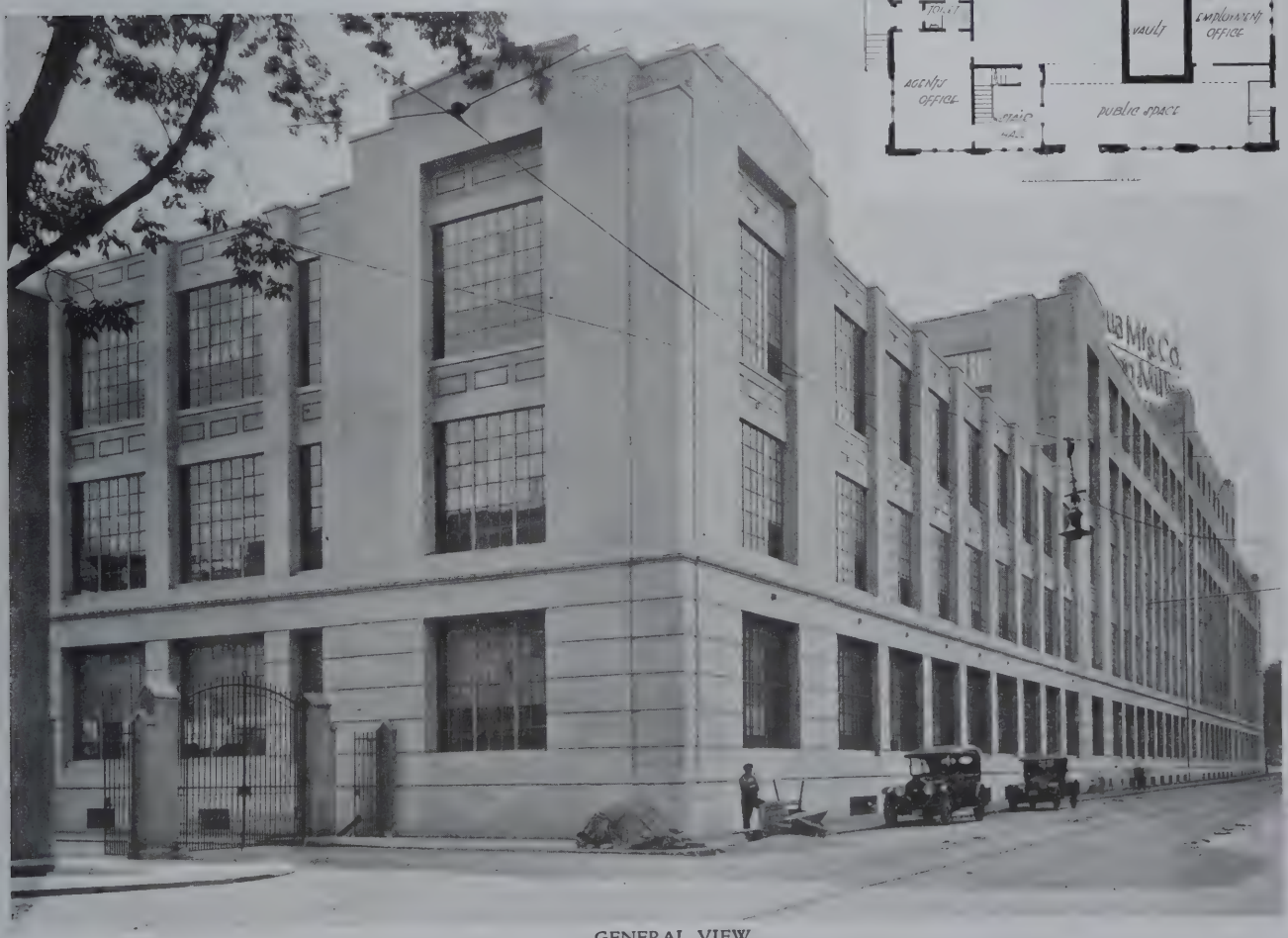
THE SCHWINN BUILDING, CHICAGO, ILLINOIS

WALTER W. AHLSCHLAGER, ARCHITECT





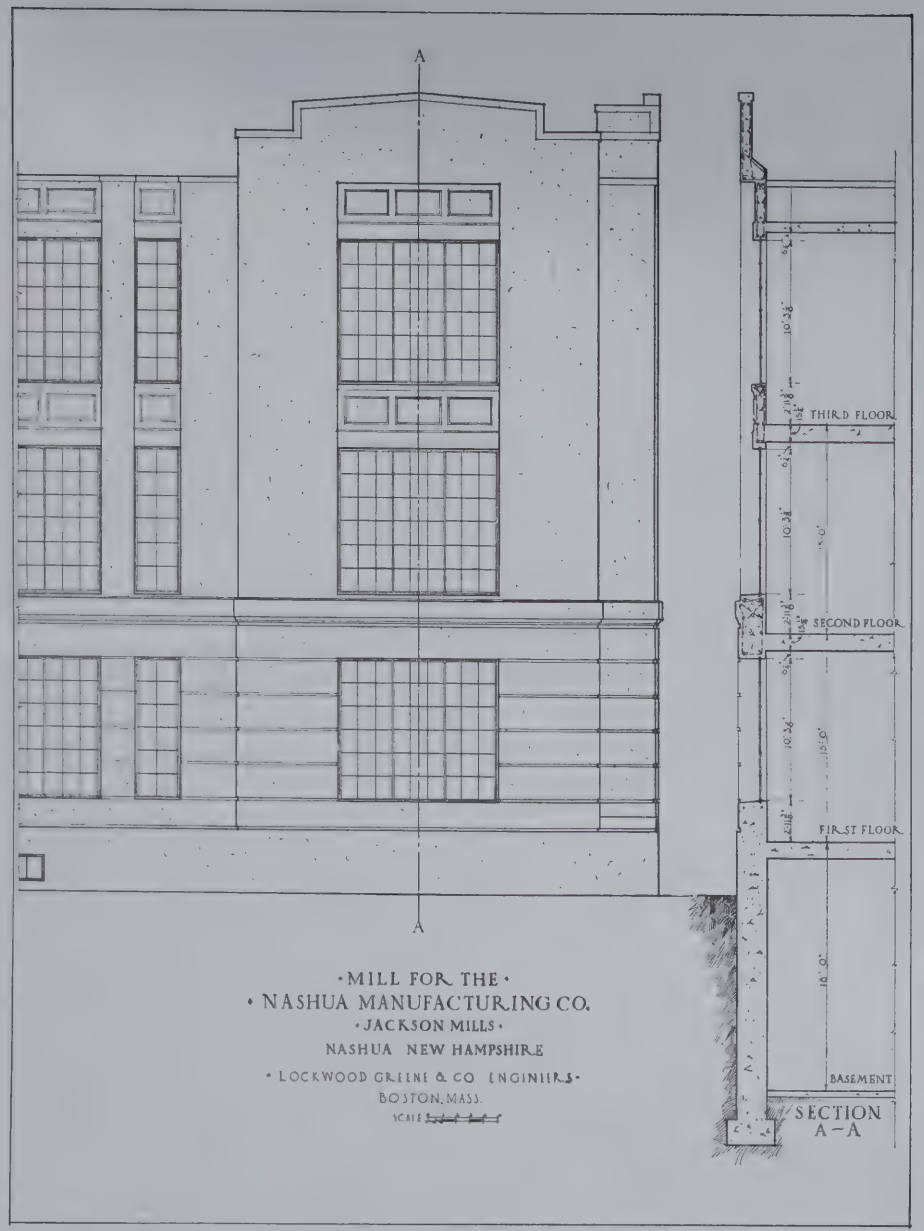
OFFICE BUILDING AND FLOOR PLAN



GENERAL VIEW

BUILDINGS FOR JACKSON MILLS, NASHUA, N. H.

LOCKWOOD, GREENE & CO., ENGINEERS





DETAIL AND VIEW OF CORNER PYLON

BUILDINGS FOR JACKSON MILLS, NASHUA, N. H.

LOCKWOOD, GREENE & CO., ENGINEERS

DECORATION & FURNITURE

Jeanne Taylor, *Associate Editors*, Leland W. Lyon, R.A.

The Architect's Control of Furniture and Decoration

ANY subject on which widely diverging opinions have developed strongly in a professional fraternity is at best difficult to approach from an editorial viewpoint. Complicate such a problem with the conflicting interests of professional and contractual service, the business interests of manufacturer, wholesaler and retailer, indeterminate ethical standards and predetermined policies based on erroneous conclusions,—and one may obtain a fair conception of the inter-related complications involved in the subject of interior decoration in its business phases.

When Gordius, the peasant king of Phrygia, had tied the Gordian knot, no man seemed able to unloose it, even for the promised reward of rulership over all Asia. Alexander the Great in his characteristic manner solved the problem by cutting this knot in two with one sweep of his sharp sword—and later fulfilled the prophecy. The methods of the great Alexander sometimes lacked finesse but usually they were productive of immediate results. Recognizing in this question of the business factors involved in interior decoration a very complicated knot, we can take precedent from Alexander and approach the subject most directly by cutting it through and carefully examining the cross section. Only by understanding conditions as they really exist can constructive comment and suggestions develop into the ultimate establishment of standards of practice in this field, fair to all who wish to be fair, and based on sound merchandising principles.

We shall therefore consider in some detail the present conditions and practice in furnishing and decorating under the definite divisions of: (*a*) The consumer field; (*b*) Merchandising and distributing; (*c*) Production. These fields are represented: (*a*) By architects and interior decorators who purchase for, or sell direct to, clients; (*b*) By the wholesale furniture and decoration trades; (*c*) By the manufacturer who sells this trade or who maintains an independent distributing organization.

RAISON D'ETRE

THE publication of the January 1921 issue of THE ARCHITECTURAL FORUM marks the first appearance of the Decoration and Furniture Department. From time to time during past years consideration has been given in the editorial pages of THE FORUM to various subjects which properly come under this heading, and the actual creation of a special department to cover this subject has consequently been a matter of evolution.

Before this step was taken careful analysis was made covering a large number of architects' offices to determine the exact interest of the profession in this subject. The letters which were sent out evoked a strong response and showed definite interest greater than had been anticipated. Naturally, many opinions were expressed regarding the business phases of this question and much general information was obtained. In this first article, therefore, an outline of such phases of interior decoration is given. The attention of readers is particularly directed to a careful analysis of points brought out in the article and suggestions and constructive criticism are invited.

The Decoration and Furniture Department will of necessity cover a variety of subjects coming naturally under this heading. It is the intention of the editors, however, largely to confine articles which will appear in this Department to suggestions and descriptions regarding furniture and materials available in stock rather than those made from special design. It is a well known fact that furniture manufacturers are successfully producing not only modern furniture of excellent design but are following closely the desirable period designs which have created interesting and artistic precedents. In the production of fabrics and other decorative materials, evolutionary steps have been taken in the past few years and today there is available a vast selection of furnishings and decorations with which the architect may carry out interiors suitable for every type of building. It will be the purpose of this Department, therefore, not only to urge certain necessary reforms in business practices and relationships, but to describe in text and plate illustrations successful examples of interior design and composition. It is also proposed to bring to the attention of architects interested in pursuing this branch of the profession information as to available furniture and materials, market conditions, and the general attitude of the wholesale decorators' trade toward co-operation with the architectural profession.

The Viewpoint of the Architect

As a result of contact with various phases of furnishing and decorating service through architects' offices, we were led to realize early in this analysis that many conflicting viewpoints were held and that practice has been in no manner standardized. In order to be certain that the chaotic conditions disclosed by preliminary analysis of this subject applied generally, THE ARCHITECTURAL FORUM has recently carried out an investigation covering over 1,000 offices of architects. The purpose of this investigation was to determine: (1) Whether or not the

architect furnishes interior decoration service for his clients; (2) What the architect charges for such service; (3) The architect's present relations with the dealer and manufacturer; and (4) The architect's method of handling furnishing and decorating projects.

The results of this analysis showed an interest in this subject far beyond that which had been expected. Hundreds of letters now in our editorial files show not only that the architect does this work and is interested in doing it, but that he feels the need of standardized service charges and improved relations with the dealer and manufacturer. He resents the intrusion by certain classes of interior decorators, as will be discussed in later paragraphs.

One of the most frequent complaints which have been made by architects in the course of this investigation is that the wholesale trade discriminates against the architect in the matter of discounts, allowing interior decorators a much greater discount and in many cases refusing discounts entirely to the architect. There is no question that this condition exists, but as there are two sides to every story it is only fair that these be presented because of their bearing on later conclusions in this series of articles.

We have been informed that some two or three years ago in New York a meeting was held including members of the wholesale decorators' trade and interior decorators. At this meeting it was decided to cut down the discounts allowed architects. While it may be true that interior decorators used their collective purchasing power in urging this course, it is also true that the manufacturer and distributor who refuses to allow an equal discount to the architect has at least businesslike grounds for so doing. The conditions on which this attitude is based are thus explained by manufacturers:

The interio decorator is essentially a contractor who purchases on his own account at wholesale prices and resells to his clients at the retail figure or in some cases the highest price he can get. On the other hand, the average architect purchases in behalf of his client and allows all discounts to accrue to the benefit of the client or, in other words, through the present system in the average architect's office, wholesale prices are available to the retail consumer. The manufacturer claims fairly that in any industry this condition is not sound. The reason that the architect does not usually retain discounts is because he feels that for his services in interior decorating he can charge on a percentage or hourly basis only and that he cannot be placed in the position of a contractor, or take payment from two parties in the transaction. Consequently, with the stopping by many furniture and decorative material houses of the practice of giving equal discounts to the architect, the interior decorator is placed in a position where he can offer his services at lower cost to the client than can the architect. The possibility of meeting this situation will be discussed in later paragraphs.

Meanwhile it is interesting to note that the large volume of furnishing and decorating now controlled by architects is being handled in various ways:

(1) The architect employs an interior decorator in the role of a professional buyer to carry out detail work of selection of materials and furniture. The architect controls the principal elements of design; the client pays the retail prices so as to provide the decorator's profit. The architect is paid by receiving a commission approximating 10 per cent on total cost or by remuneration on an hourly basis.

(2) The architect is called upon in consultation on the work of an interior decorator who is dealing directly with the client, for which he receives a service fee.

(3) The architect maintains an interior decorating department which takes advantage of all discounts in lieu of commissions.

(4) The architect purchases at the best possible prices, including all available discounts, and bills his client exactly at cost, receiving a commission on the work. In this manner he takes advantage of those distributing organizations which are still willing to allow him full discounts.

It was found in the course of this investigation that furnishing and decoration in all types of buildings were almost without exception controlled directly by architects and that many architectural firms contract for the complete design and supervision of a project, including all furniture and decorations. The volume of this business controlled by architects will be discussed in later paragraphs under comments on the Manufacturer and Dealer aspect.

What the Interior Decorator Thinks and Does

Interior decoration carries with it all the attributes of a profession, a trade, a contracting activity and a buying service. This branch of the building field includes many earnest workers of varying degrees of ability and in practice there seem to be approximately three classes of interior decorators:

(1) The professional interior decorator, highly skilled in design and general knowledge of the subject, and capable of carrying out intricate projects involving the expenditure of large sums of money.

(2) What we deem the "merchant class" of interior decorators, dealing principally in antiques and unusual furniture and fabrics and often maintaining shops. An interior decorator of this class does not as a rule work on any standard retail price basis but buys wherever possible at the lowest prices and sells wherever possible at the highest prices. Here many unfortunate practices have developed and it is due to the questionable and sometimes directly dishonest policy of some members of this class of decorators that many charges are unfairly lodged against the entire fraternity of interior decorators.

(3) A third class of interior decorators might well be termed "professional shoppers." Individuals

in this class have of course developed a certain knowledge of color, texture and design. This is the type which usually works with the architect on smaller projects, purchasing through the wholesale decorators' trade and selling at the retail price. A decorator of this type has a number of valuable assets in actual practice, including a quite complete knowledge of the market covering available furniture and materials. This type of decorator is usually called to work under the direction of the architect and to combine with the architect's broad knowledge of design an intimate knowledge of detail in fabrics, colors and furniture. Apparently there are no standard qualifications necessary to become a decorator and consequently to be favored by the wholesale trade.

We find that among the ranks of interior decorators there are many individuals of recognized ability who are in every sense professional, but as we pass down the scale we find within the ranks graduate house painters, curtain makers, furniture salesmen, and of course many who consider their activity more or less as an avocation.

It is not necessary to discuss the fact that there is much dissension in the ranks of this fraternity, as well as a strong feeling on the part of many against the handling of furniture and decoration by architects. Similarly, there exists among the architects a strong feeling against certain classes of interior decorators, particularly those who are called in without consideration for the architect and who make suggestions not only out of keeping with the design as the architect has visualized it, but often involving interior structural changes entirely contrary to the spirit of the design as it has been developed by the architect.

We realize, of course, that in treading this maze of interior decoration we must touch some dangerous spots and some sore ones, but we realize also that as the interests of architects in this field are growing rapidly it is necessary to develop a clearer mutual understanding—at least between the architectural profession and the wholesale decorators' trade, if not between architects and the entire decorating fraternity. We can visualize very definitely certain standardized methods which will give satisfactory results to all who are following their business in a logical manner and it is hoped that some of these points will be clearly developed through this and later articles.

Facts About and For the Manufacturer and Dealer

Having in a general manner pictured conditions relating to interior decoration in the architectural profession and the interior decorating fraternity, it is necessary to give consideration to the viewpoint of the manufacturer and dealer and perhaps to bring to their attention facts as yet only dimly realized.

It is indeed a coincidence of unusual interest that as this article is being written there comes to our attention the December, 1920, issue of *Good Furniture*, a well known manufacturer and dealer periodical. In order to show the exact editorial policy of this publication regarding the subject under consideration we quote from one of the advertisements of *Good Furniture:*

"We especially appreciate our position as a recognized medium of information between manufacturer and dealer during this evolutionary period. The signs of the times, the unfoldment of the greater purpose for 1921, can be clearly seen from cover to cover in this issue."

In the copy of *Good Furniture* mentioned we find an interesting section which has been running for some months under the general heading "Upbuilding a Great Industry," and we note that Chapter 7 is headed "The Kinship of Architecture and Furniture." Reading through the article there are to be found several significant paragraphs from which we quote:

"What is the matter with the architect? Does he consider that he has done his full duty to himself and his client when he plans a fine building suited to grounds and environment? Is he merely an engineer, an expert on proportions, stains, form and superficial coloring? Does he stop with supervision of construction because his profession is so lofty that he is above consideration of the home in its finished state? Why does he not finish what he has started, and suggest the colors of walls and ceilings, the kinds of rugs and pictures and the types of furniture that should go into the structure his brain has developed?

"It seems clear enough that the architect, who is a student of periods and styles of all ages, owes it to art and posterity as well as to the present generation, to apply his knowledge to perfection of interior as well as exterior.

"There seems little enough reason why the architectural profession should hold itself aloof from the problems of interior decoration, or consider itself above such work. You would think little of a surgeon who performed a difficult operation and then ignored the subsequent welfare of the patient.

"People who are able to *pay* are not always capable of discrimination. This is particularly true in the selection of home plenishings. Very often one sees the most deplorable taste exhibited in furnishing a new home, a splendid hotel or a public building.

"Buyers who seek the advice of trained decorators avoid this fault; but there are those almost without number who buy without professional aid, and having no real conception of actual fitness, make a sad fiasco of their selections when these are finally placed."

These are indeed interesting and constructive suggestions, particularly as they emanate from channels advisory to the manufacturer and dealer. In turn we may state that the results of our investigation in the architectural field show that the purchase of millions of dollars' worth of furniture

and decorative materials is controlled directly today through the offices of thousands of architects and that interest is growing in this subject to a point where such co-operation as that suggested in the quoted paragraphs is indeed necessary.

Recognizing the architectural profession as a definite and powerful buying unit, constantly increasing in its control of expenditure in this field, it is evident that the wholesale decorators' trade backed by the manufacturers should now give serious consideration to the creation of a more equitable and friendly relationship with the architectural profession.

It must be realized that architects will work in one of three ways:—first, directly controlling all design and purchase; second, utilizing the professional buyer class of interior decorators to carry out detail purchases; third, in some cases, recommending the employment of high class professional decorators to co-operate in the solution of special problems.

It is evident that in this field the architect is to be limited only by his own ability and experience and that he will seek the services of interior decorators only in proportion to the difficulty of the problem and to the amount of knowledge which he may possess on the subject. We do not claim that all architects are fully equipped by experience or knowledge to handle the problems arising in this connection. Is it not logical to believe, however, that the average architect even without special training is more capable of rendering service to this end than the average interior decorator?

We have endeavored to give a fairly comprehensive outline of present conditions in this field, particularly as affected by activities of the architectural profession. The letters which we have received in the course of this investigation show a marked interest, not only in receiving all possible information on the subject, but in encouraging some activity which will bring about standardized conditions in this field.

While we have formed certain fairly definite conclusions regarding the possible relationship of the architect to the manufacturer and the interior decorator, together with suggestions regarding dealings between the client and the architect in the matter of furnishing and decoration, we shall withhold these suggestions as the subject of an article to be published in the February or March issue of THE FORUM. By readers who have not already expressed their opinions it is hoped that suggestions will be made freely and frankly in order that all opinions may be correlated and some definite action taken to bring about better understanding and better practice.



Dining Room of House in New Haven, Conn.
Ewing & Chappell, Architects

MINOR ARCHITECTURE
EXEMPLIFIED IN MODERATE COST BUILDINGS

A Country House Alteration

LUCIAN E. SMITH, ARCHITECT

SOME of the most interesting work being done today consists in the remodeling and adapting to modern conditions of old city or country residences. With all of its defects in the way of design and its shortcomings in planning building a generation ago was apt to be well done. It was before the era when prices for materials of every sort had soared to such figures that substitutions of various kinds were resorted to, and builders of that period worked with the idea of producing structures which would endure. With a building structurally sound and well built to begin with alterations are frequently well worth while, often resulting in improvement out of all proportion to the cost involved.

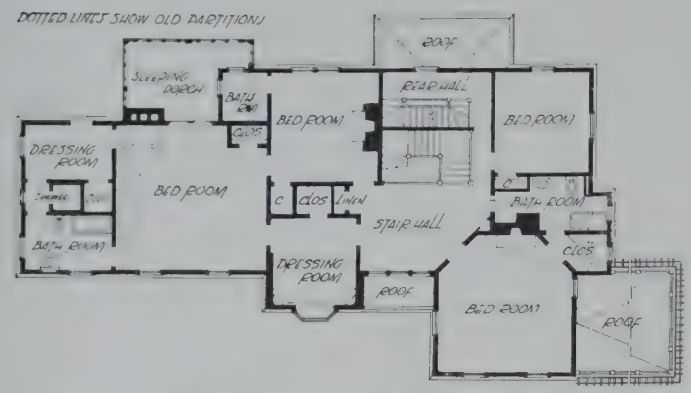


Entrance Front of Original House

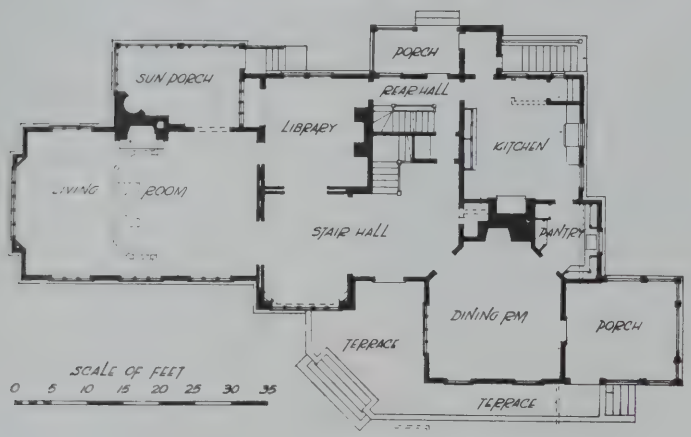
The illustrations show the original appearance of a house on Llewellyn road, Montclair, N. J., built about 40 years ago, and its greatly changed exterior after being successfully altered by Lucian E. Smith, architect. In this instance much of the entirely transformed appearance of the building is the result of removing an unnecessarily large veranda and considerable



Entrance Front Showing Alteration of House



Plan of Remodeled Second Floor



Plan of Remodeled First Floor

superfluous ornament, the correcting of the most glaring architectural faults of the clapboarded house and the coating of the entire exterior with rough coated stucco applied on metal lath. The use, to a moderate extent, of trim to simulate half timber in an instance of this kind would seem to be quite justifiable since it is obviously employed merely as decoration or ornament and makes no pretense of being anything else.

The exterior has gained a certain unity of expression by the placing of the windows in groups and by the use of casements which are especially suited to a house of this kind. An added character is given by the use of brick for steps and for the floors of terrace and veranda. All the exterior woodwork has been stained and the roof is covered with shingles of green and brown laid irregularly. The chimneys are whitewashed.

The interior alterations consisted chiefly in the removal of various partitions to correct the proportions of certain rooms, the addition of several bathrooms and the enlarging of the living room which, in its altered form, is 20 x 32, paneled with wood from floor to the ceiling of slightly roughened plaster, having incised ornament. The living room has a stone chimney piece and the casement windows are filled with leaded glass having silhouettes of grotesque animals and birds.

The plan of the house which has remained practically unchanged is interesting in the spaciousness it shows in contrast to modern planning, where the architect is forced through conditions of cost to economize in area and cubage. There is, therefore, a definite advantage to-day for the client in solving his problem of a modern house in following this method of procedure. The increased value of the house greatly exceeds the cost of improvements and in cases where the location is desirable it can later be sold at a profit when new construction is contemplated. Considerable skill is required for planning successful alterations and their results often prove their importance.



Extended End of House Showing New Porches

An Efficient School of Economical Type

McLAUGHLIN & BURR, ARCHITECTS

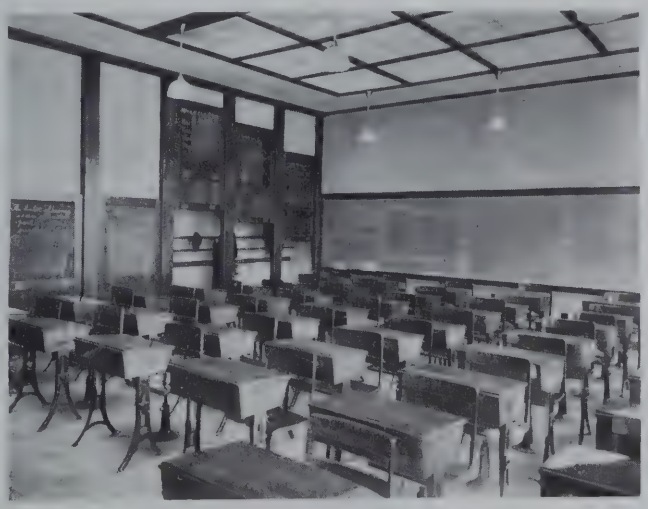
By G. HOUSTON BURR

THE erection of houses at Quincy, Massachusetts, to accommodate 450 families soon brought before the school authorities the problem of how the children of these families were to be accommodated in schools that were already crowded. This condition was met by the United States Housing Corporation agreeing to erect an elementary school which would eventually become the property of the city.

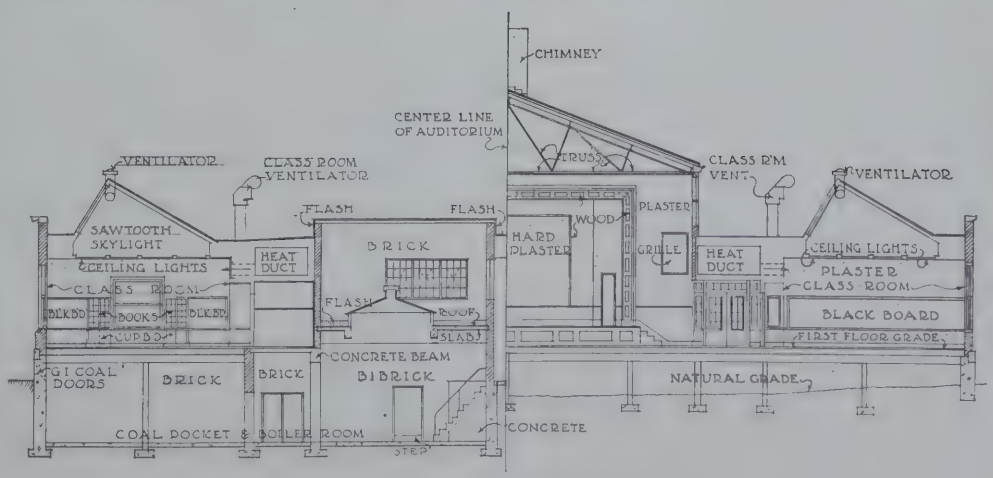
The requirements of the school were left to the local authorities with final decision as to construction and architectural treatment vested in the architectural department of the Corporation. It was decided that a building of 18 classrooms would accommodate the additional pupils in the district where the government houses had been erected and that the building should be a one-story school with the classrooms lighted by overhead light. Two of the rooms were to be fresh air rooms and one a domestic science room. In addition, the building was to contain an assembly hall to seat about 600 and a small library, both of which could be used for community purposes, administrative offices, toilet rooms and teachers' room.

The Quincy school authorities had visited a one-story school in the western part of the state lighted by overhead light and were very enthusiastic about this method of lighting, but in this school the classrooms were without side wall windows and the architects raised the question as to the psychological effect on pupils being shut up all day within four walls with only overhead light. In order to get further information on the subject several cities where one-story schools are being constructed were visited, and the information obtained from this visit was very instructive.

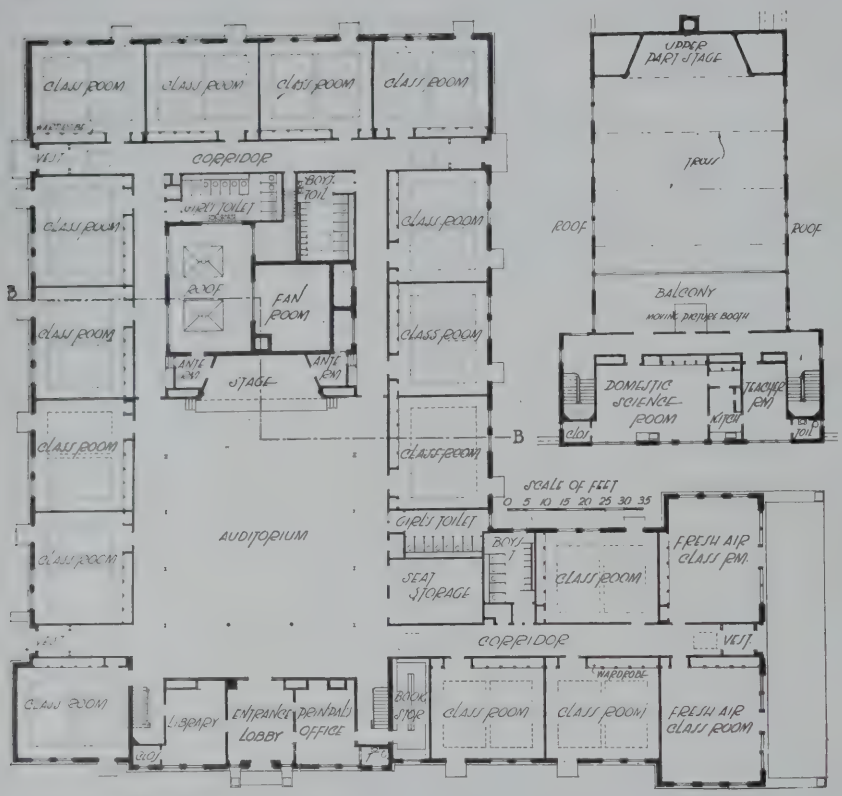
Everywhere the school authorities were agreed that it was very essential to have at least some side wall light in order that pupils might relieve the monotony by being able to look out of the windows. In one city it was felt that the psychology of this was important enough to discard the unquestioned merit of overhead lighting and to light the rooms entirely from the side walls. After considerable study it was finally decided to light the rooms with saw-tooth skylights facing the north and with fairly large windows in the side walls. This solution proved very satisfactory and the classrooms have excellent light even on dark days. Study of the plan soon developed that 12 classrooms naturally grouped themselves around the assembly hall and boiler room portion, thus leaving six rooms to be accommodated elsewhere. The first thought would be to arrange the six rooms either by extending the building to the rear or on each side of the front so as to make a symmetrical front elevation. The first plan was impossible because the lot was too shallow and the second was hardly feasible by reason of the natural conditions of the lot which, although fairly level, had an outcropping of ledge at the interior angle. Therefore to save expense the building was designed with five classrooms on one side, making an L shaped plan, and the center



Typical Classroom



Section on "B-B" Shown in Plan



Floor Plan and Upper Part of Auditorium with Adjacent Rooms

portion of the front of the main building was carried up two stories to accommodate the domestic science classroom and a teachers' room with a small kitchenette. This kitchenette was added because it was found that the majority of the teachers came considerable distance to school and did not return home for the luncheon hour. Therefore some arrangement was made so that they could prepare their own lunches in the school.

Each classroom is arranged for 42 pupils and has sliding blackboards and bookcases at the teacher's end and Chicago type wardrobes along the corridor side. The rooms are heated by direct radiation controlled by automatic thermostats and are supplied with fresh air through ducts carried above the ceilings of the corridors from a central fan system; the classrooms ventilate under the sliding doors of the wardrobes causing a constant current of air to pass up through the clothes and they are quickly dried in wet weather and without odor in the classroom. Foot warmers are placed at convenient points and unlike the usual type, these are raised to form a platform.

Every classroom has an emergency exit opening directly outdoors so that in case of fire no pupil is sent back into the building. The floors of the classroom are of maple, but the floors of the corridor and assembly hall are of rubber tile about ¼ inch thick and 18 x 24 cemented to the underfloor. This makes a very excellent surface as it is practically noiseless. The assembly hall is equipped with a fair sized stage and moving picture machine booth.

When working drawings were started on this school definite instructions were given the architects that every item must be fully covered in the plans and specifications and that on no account could there be any extras. In this connection it may be interesting to know that not only was the building erected without any extras, but at the completion of the work an allowance of $24 was returned to the Corporation due to not having used all the amount allowed for temporary heating. The school was erected in 1919 at a total cost of approximately 31 cents per cubic foot, or about $275 per pupil, including grading and landscape work.

Experience in every type of schoolhouse construction has convinced the architects that the one-story school is the most economical type to erect in localities where land is inexpensive. The safety of having every classroom exit directly to the outside in case of fire makes this type of school superior to a two-story building, even if it is of fireproof construction. A building of this kind makes for simplicity in school administration and with proper study can be made very pleasing architecturally. Overhead light is the very best means of lighting classrooms but more costly roof work makes a school so lighted slightly more expensive.



Auditorium from the Stage



VIEW OF MAIN ENTRANCE

ELEMENTARY SCHOOL FOR U. S. HOUSING CORPORATION, QUINCY, MASS.

McLAUGHLIN & BURR, ARCHITECTS



GENERAL VIEW



FRESH AIR CLASS ROOMS

ELEMENTARY SCHOOL FOR U. S. HOUSING CORPORATION, QUINCY, MASS.

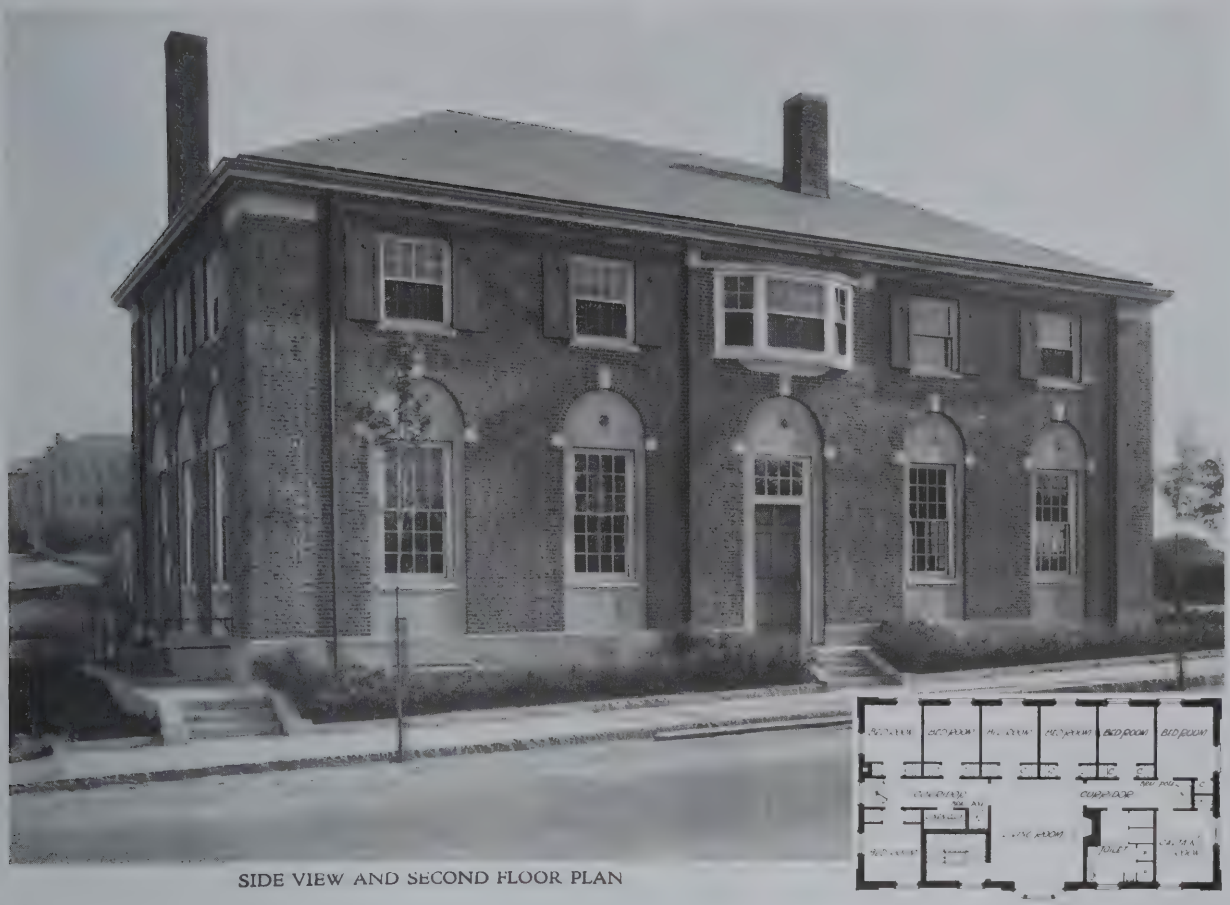
McLAUGHLIN & BURR, ARCHITECTS



GENERAL VIEW AND FLOOR PLAN

OFFICE BUILDING OF THE NEW ENGLAND POWER CO., WORCESTER, MASS.

JOHN BARNARD, ARCHITECT



SIDE VIEW AND SECOND FLOOR PLAN



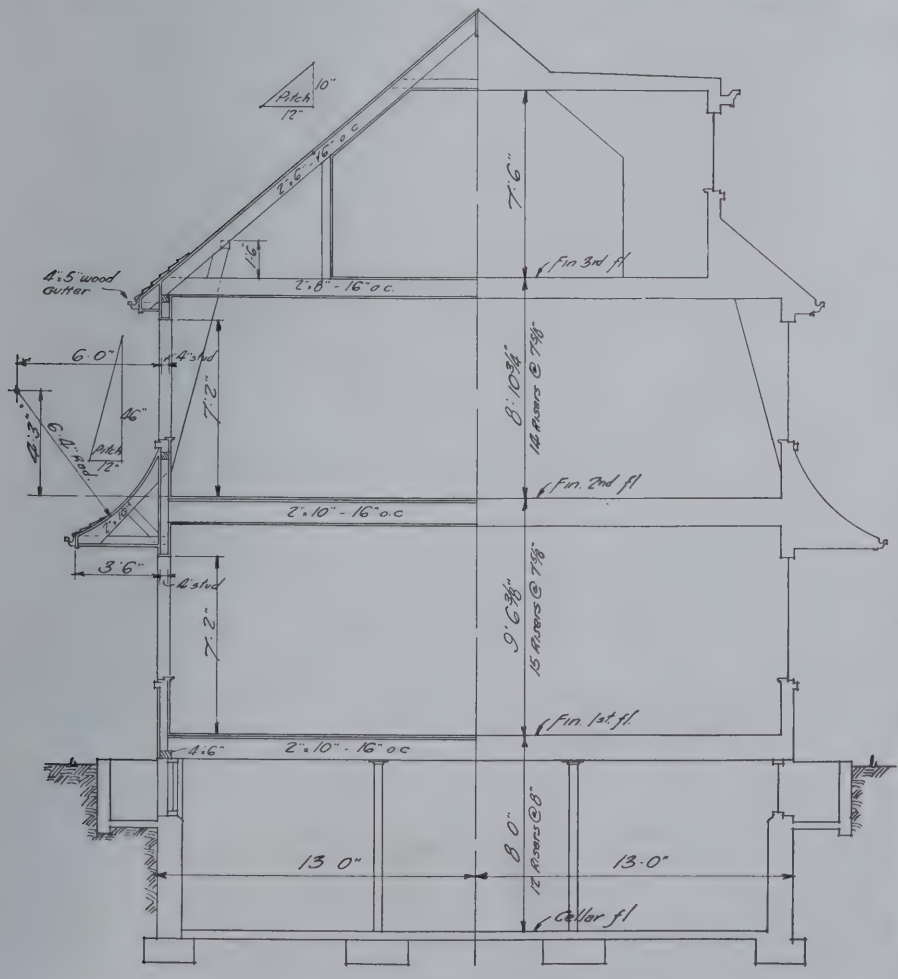
GENERAL VIEW AND FIRST FLOOR PLAN

BRANCH FIRE STATION FOR THE CITY OF SALEM, MASS.

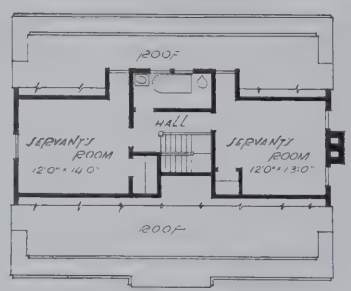
FRANK S. WHEARTY, ARCHITECT



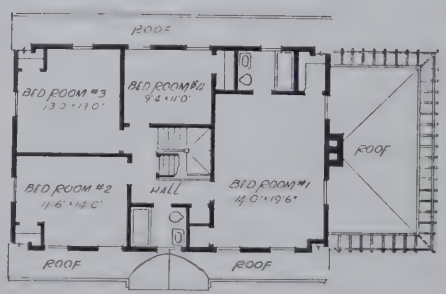
GENERAL VIEW



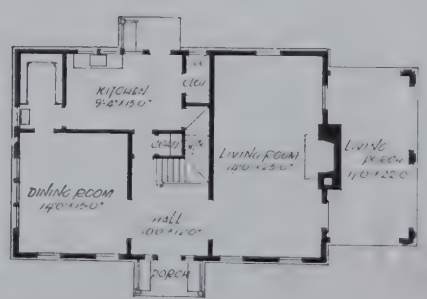
TRANSVERSE SECTION



THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOUSE OF PHILIP P. BARBER, ESQ., TENAFLY, N. J.

R. C. HUNTER & BRO., ARCHITECTS

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

A Large Concrete Warehouse

By R. E. BRIGHAM

INTEREST in bigness has been called a purely American, modern characteristic. Our largest shows on earth and our colossal buildings have been pointed out as showing that we are interested in quantity sometimes at the expense of quality. However, it is doubtful whether this interest in the largeness of things is either purely American or purely modern. One can easily understand the competition between the builders of early ages who vied with each other in the erection of larger and larger cathedrals and other monuments. Certainly there was nothing modest with regard to the design and construction of St. Peter's and the Emperor Justinian, who was responsible for the erection of Saint Sophia, did not feel that he was building a small or insignificant structure.

There is no doubt but that everyone is and always has been interested in large buildings. It is also true that in most cases where buildings have been erected covering large areas, or extending high above the sky line, they have been well designed from an architectural point of view. Both the Municipal Building and the Woolworth Building in New York are tremendous structures, and both are considered as having distinct architectural merit which has attracted wide attention.

A building totally different in character, but of large size considering its use, is now being constructed in lower New York; this building is known as the 395 Hudson St. Building. It will be used largely for a warehouse but there is a section which will be given over to use as a garage, and certain



The 395 Hudson Street Building, New York
McKenzie, Voorhees & Gmelin, Architects

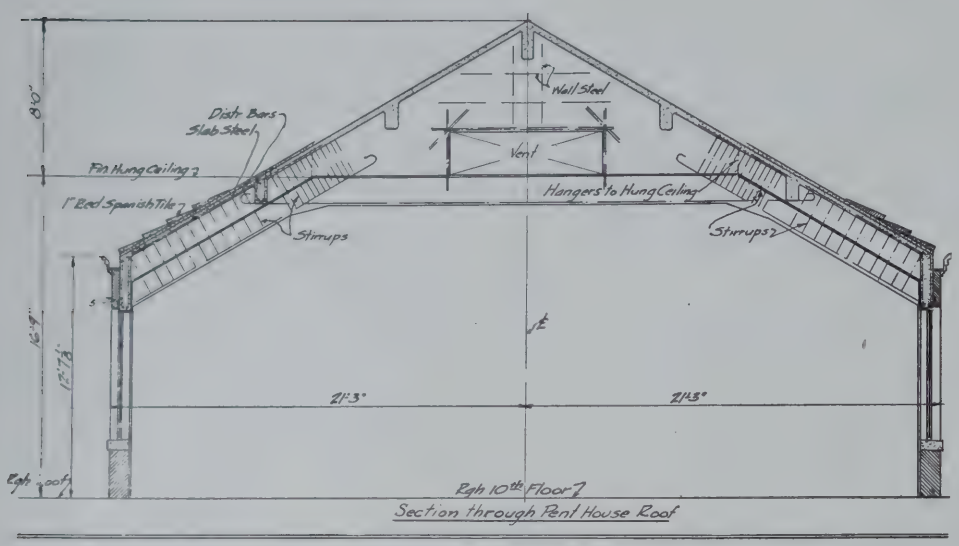


Fig. 1. Section through Pent House Roof

floors will be used entirely for shop purposes and others for offices. The building will cover an entire city block. Its longest dimension will be 339 feet, 9½ inches and it is approximately 200 feet wide. It will be a ten-story building with a basement and with large pent houses accommodating machinery, tanks and other apparatus.

The design of a warehouse presents great difficulties to architects. The firm of McKenzie, Voorhees & Gmelin, who were commissioned to design this building, have confined their efforts to the work of creating symmetry of design and the proper scale of mouldings and cornices. They have approached the problem from a standpoint of maintaining harmonious proportions and they feel that this can be done in a warehouse as well as in any other structure.

The warehouse is after all nothing but a huge box with the walls pierced with as many and as large windows as possible. This presents a checker board pattern on the exterior which is difficult to deal with no matter how it is approached. By careful studying of mouldings, and proportions and positions of band courses, the architects have attained an extremely pleasing appearance for this type of building. They have also done away with the ugly tanks and other roof structures which have so badly marred the skyline of New York, treating the pent houses in such a manner as to make them integral parts of the building and making the design mass up in an interesting manner.

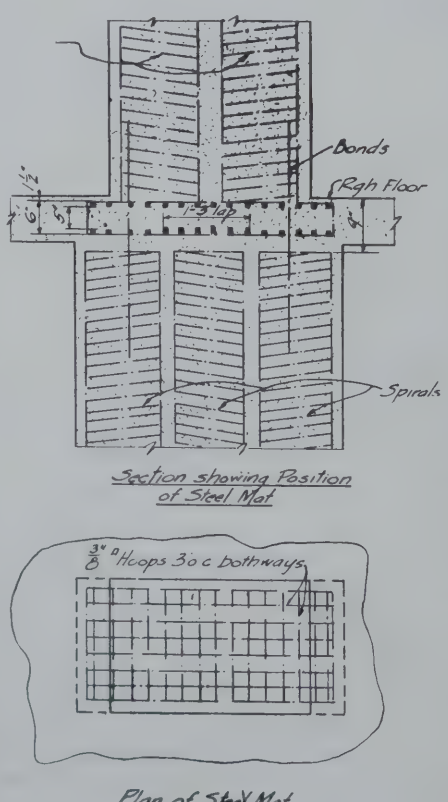


Fig. 2. Transition of Columns

Planning for a building of this kind is influenced to a much greater extent by the requirements of a labor law than by the dictates of the Ecole des Beaux Arts. No wide means of circulation, no accentuated axis dominates the plans. The placing of stairways is determined by the distances to them from points in the building and the locations of elevators are determined by their nearness to the loading and shipping platforms, or to the entrance hallways.

Only on the ninth floor where the offices are located is an attempt made to maintain corridors giving an easy access to all parts of the building, and this is effected by the elimination of certain columns on this floor. On the tenth floor, which might be looked upon as the first floor of the huge pent house (See Fig. 1), will be located the large dining room and kitchen, the rest room for women employes, a conference room and a demonstration room. This plan will cover a fairly large number of square feet, but there will still be left a large area of roof which will be used for recreation purposes. At present it has not been decided whether this roof area will be used for hand ball courts or bowling alleys, but it is certain that recreational features will be added.

However, the chief interest in a building of this type lies in its construction. This structure will be, when completed, the largest reinforced concrete building in the Borough of Manhattan, and perhaps one of the largest commercial buildings built of this material anywhere in New York. The type of construction that will be used is flat slab construction with no beams showing in the ceilings except in certain portions where beams will not be objectionable. Flat slab construction is known more outside of New York than it is within the limits of the metropolis; in fact, until recently no provision had been made for this type of structure by the building department, and it was not until a special ruling had been adopted on July 8, 1920, by the Board

of Standards and Appeals that the engineers' designs for the building could be approved.

In most cases the Chicago Code has been used by engineers designing work of this character. In this building the engineers have had a chance to show the flexibility of concrete construction. Much of the criticism which has been directed against concrete work has been on account of the fact that it was supposed to be limited in its scope and inflexible.

In this particular instance the engineers have shown that a large degree of flexibility can be developed in reinforced concrete structures. As an example of a case of this kind, it might be noted that on two sides there are wagon courts into which trucks will be driven to deliver and receive goods from receiving and loading platforms. It is naturally desirable to have wagon courts as wide as possible and yet in these there must be columns carrying the structure above. In the past it has always been felt that reinforced concrete columns in a building over ten stories high must be of colossal diameters. Such columns would be absolutely out of place in wagon courts.

The engineers have surmounted this difficulty by designing the sections of columns which will appear in the wagon courts as having rectangular sections which change from rectangular to round at the second floor. In some cases a change in section is effected so that instead of having the long dimensions perpendicular to the building line, as in the wagon courts, these are parallel with the street front. This is done so that columns do not project excessively into the second floor but are flat along the wall.

The method used in effecting the change from rectangular to round columns is almost unknown to any but concrete engineers. Use is made of reinforced concrete mats (See Fig. 2) which are large rectangular slabs of concrete reinforced by means of ⅜-inch round rods looped at right angles to each other and spaced approximately three inches on centers in both directions. The mats are practically all steel filled in with concrete. These are placed on top of the rectangular columns, in much the same manner as butt plates are used between sections of steel columns, and the round column is carried on top. Another unusual feature is the use made of columns having oblong sections at elevator shafts. It is desirable to save as much room in the elevator shafts as possible and it would be difficult to bring the partitions of the elevator shafts against circular columns and for this reason these columns have rectangular sections and except on the top floors are much longer in one direction than in the other.

The simple method of constructing most of the columns throughout the building is that in which spirals of steel and vertical rods are used to reinforce the concrete in the column (See Fig. 2). The method of reinforcing the columns at the elevator shafts is that in which two and sometimes three

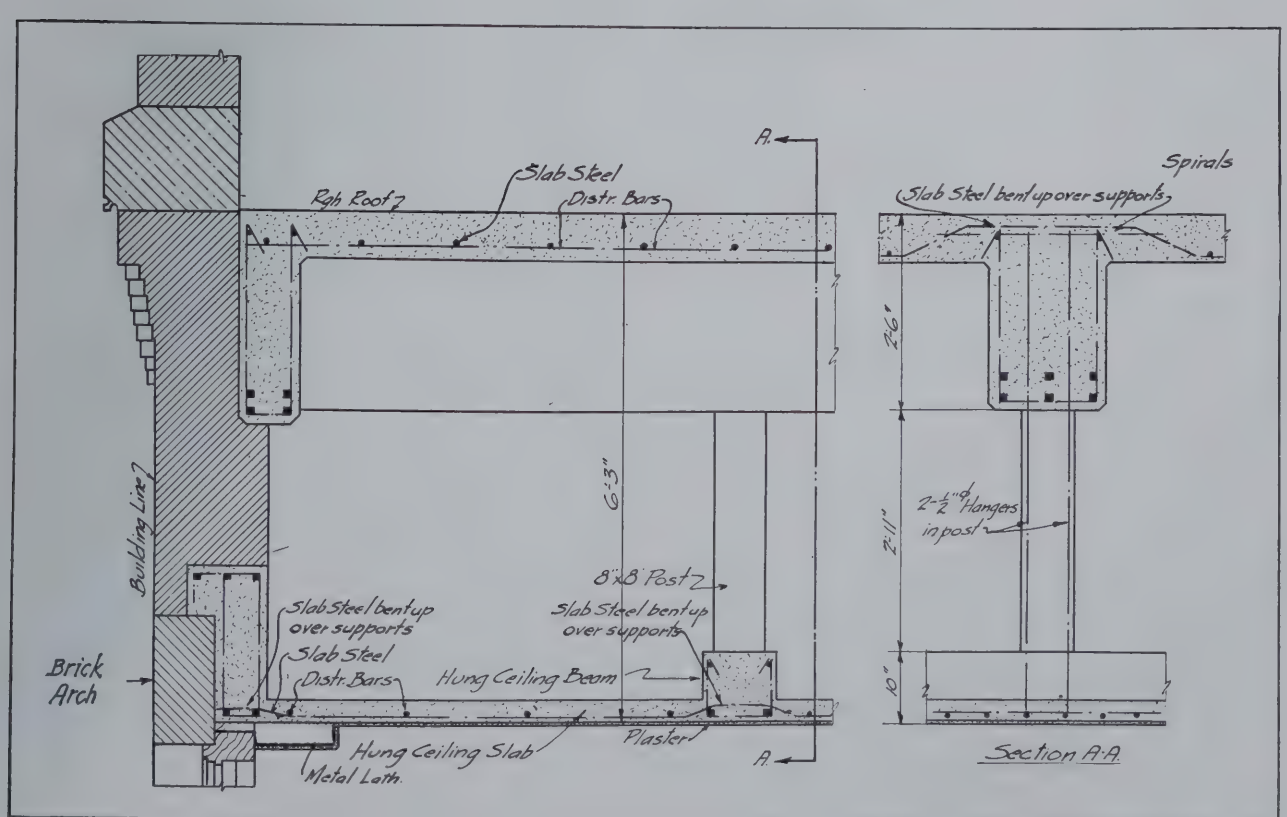


Fig. 3. Section through Hung Ceiling

spirals are used in the reinforcing, and all spirals are then encased inside the rectangular concrete. As the columns reach the upper stories of the building they decrease in size, naturally, and where three spirals were used at the basement and first floors only one spiral is used at the eighth and ninth floors. The changes from the large to the small columns are effected in the same manner as the changes from rectangular to circular columns, that is by means of mats placed between the large and the small sections.

Another interesting detail is the design of a portion of the first floor. In this portion there will be located racks in which will be stored electric conduits and owing to the heavy load of these conduits the floor is designed for a live load of 1,000 pounds per square foot. This floor is supported by means of girders and beams and not by means of the flat slab construction which is characteristic of the rest of the building. Except for the fact that the beams and girders are all designed deeper and wider than those found in other places in the building where this type of construction is used, no special difficulty has been encountered by the engineers.

Footing problems were not particularly difficult as the soil encountered was unusually good. When the excavation was made for a certain section of the basement, however, it was found that the good soil which had been found in the test borings did not extend over the entire area so in this portion the footings were designed to impose a load of three tons per square foot upon the soil, whereas the majority of the footings were designed to impose a load of four tons per square foot. All footings under the interior columns are rectangular, pyramided, reinforced, concrete footings. Under the outside walls the footings are made to be continuous in almost all cases but at one corner a footing was designed in such a manner as to take a load of four columns—one corner, two wall columns and one interior column.

On the ninth floor, which will be used for office purposes, intermediate columns are left out and spans of 40 feet are encountered which must be taken care of by reinforced concrete girders. In order to avoid having these large girders drop down below the ceiling of the ninth floor, a hung ceiling is used which is constructed of light reinforced concrete of sufficient strength so that a small live load can be imposed upon it (See Fig. 3). In this hung ceiling space are distributed the heating mains and the heating supply pipes drop from this space to the basement and return in the basement to the boiler. The hung ceiling space is also used for the distribution of ducts into which are gathered the ventilating ducts from the toilet rooms and shop floors. The use of a hung ceiling of a building of this type is somewhat unusual.

The structural drawings show the concrete construction of the hung ceiling space over the ninth floor, the steel and concrete mats used between sections of columns and the type of roof construction in the pent house roofs.

It might be noted that in this building unusual care has been taken to install first class mechanical equipment. The sprinkler system is very complete. It is supplied by two sources of water supply and in addition there is a fire pump installed capable of delivering 1,000 gallons per minute at the top floor to the sprinkler and standpipe system. This water is lifted to a height of over 151 feet and is delivered at a pressure of 100 pounds per square inch. The sprinkler system will be divided into six systems each fed by an independent riser. In addition there will be dry lines in both wagon courts and these dry lines will be equipped with an accelerator which will enable water to flow to any particular head in the dry system almost as soon as the head opens up.

The heating system for this building is of a type usually found in the better class of office buildings. It is a vacuum system with overhead mains. The theory of the overhead main is that the steam and water of condensation both flow in the same direction, and this does away with water hammer. All branches are taken off above the floor and all radiators are of wall pattern making it possible to clean around them. The plumbing installation will be of a very high standard and all fixtures are hung from the wall in order to secure the highest degree of sanitation and cleanliness.

There will be ice water lines to the drinking fountains on all floors. A small refrigerating plant will be used. The entire system will be equipped with galvanized wrought iron pipe. There will be two compressed air lines to the shop floors, one having a pressure of 65 pounds and the other a pressure of two pounds.

It would seem that this is an unusual building considering the purposes for which it is designed. By reason of its size and also on account of its careful architectural treatment, it is to be classed above the average warehouse. Because of the great care given to the mechanical equipment, the plumbing, heating and electrical work, it will be of the most carefully designed type, and the building will be one of the most complete erected for shop as well as warehouse and commercial purposes in Manhattan.

The building is unusual also as illustrating the possibilities of securing good design in a building which is often neglected and with a material which is seldom used to such advantage. In designing structures to be built of concrete emphasis may well be placed on the note of strength and the building yet be given an appearance of architectural symmetry and dignity.

Truss Design and Details

PART III. HEAVY WOODEN TRUSSES WITH PARALLEL CHORDS

By CHARLES L. SHEDD, C.E.

WOODEN trusses with parallel chords are frequently used in building for long spans and heavy loads. It is more common to use such trusses in railroad bridges of second class roads but the use of them should be understood by one engaged in building work as the principles are fundamental and the knowledge of them will enable the designer to take care of cases where their use is imperative.

In Fig. 10 is shown a wooden truss with parallel chords. The slope of the diagonals should be in the neighborhood of 45° but this may be varied considerably in case of emergency. If they are flatter it makes the horizontal component greater causing the use of greater lugs in the castings or of deeper notches where no casting is used. Besides this a flat diagonal is longer and the additional length might prevent the use of a smaller and more economical piece on account of the possibility of

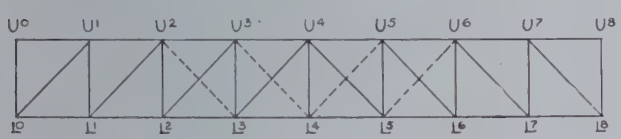


Fig. 10

buckling. The increase in the size of the lugs is the most serious trouble as it causes the waste of more wood in the bottom chord and increases the trouble due to shear as will be described hereafter in dealing with Fig. 13. If the diagonals are made steeper than 45° no serious difficulties are encountered, but the economy may not be as great.

The panel points should also be located with reference to the loads to be applied. These loads should be as near as possible to the panel points. When the load is practically uniformly distributed the panels should be short. Any loading applied to the chords between the panel points causes bending in the chord which increases its required size. A conventional way of marking the panel points is shown in Fig. 10—U^0, U^1, U^2, etc., for the upper chord panel points and L^0, L^1, L^2, etc., for the lower panel points. The members are then denoted by the panel points at their ends; thus the end diagonal is known as L^0, U^1, etc.

The diagonals are of wood and are designed to take compression only as they simply butt at their ends. The verticals are of wrought iron or steel rods and are designed to take tension only as they are too slender to resist buckling and are connected to the truss only by nuts and plates on the outer side of the chords.

If the load on the truss were greater on one end than on the other (as would be the case with a snow load on one side of a roof) the stresses in the diagonals near the center and also in the verticals would be likely to be reversed in character. This would cause the opening up of the joints and bending in the chords resulting in trouble of a serious nature. To avoid this, wooden diagonals are added as shown by the dotted lines in Fig. 10. These are called counters and in the case of unsymmetrical loading a counter would be doing the work instead of the diagonal in the opposite direction. In trusses with broad chords the main diagonals may be made of two wooden sticks and the counter may be placed between them. If the width of the truss will not allow this treatment the counter may be made in two pieces butting against the main diagonal. If the diagonals are at 45° the counter will butt squarely against the diagonal, and they need only be spiked together at this point, but if the counter and the diagonal intersect at an angle other than 90° the counter would have a tendency to slip along the diagonal and thus nullify its effect. This, however, can be overcome by notching the counter slightly into the diagonal, the depth of the cut depending on the angle and the amount of stress which it is possible for the counter to carry. A notch of less than one inch is not very reliable although ¾ inch is used by some designers. When the counter passes between the two members of the main diagonal a small bolt of ½- or ¾-inch diameter is generally used, passing through all three sticks.

The joint at L^1 or L^2 may be designed as shown in Fig. 11. Here a casting is used to transfer the stress

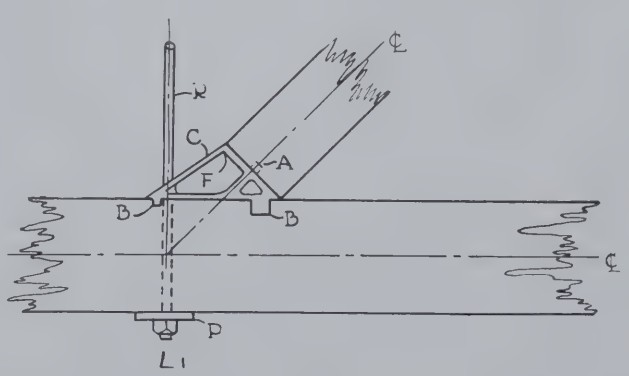


Fig. 11

from the diagonal into the rest of the truss. The ribs, such as C, should not be less than ¾ inch in thickness as the forms used in casting may float a little which might seriously lessen their thickness. In castings, even with ¾-inch ribs, the moulds should be so placed that the openings in the casting will be vertical to minimize this floating. At the intersection of the ribs a slight curve called a fillet of about ½-inch radius is used to strengthen the

point and facilitate the casting. A small round projection may be placed at A to project into the diagonal about an inch to keep it from slipping. Some designers prefer to leave a hole in the casting here and insert a short rod. This latter scheme makes the erection somewhat easier.

To keep the casting from slipping along the chord, lugs B are formed, their combined depth being proportional to the horizontal component of the stress in the diagonal. Two are often used to lessen the depth of the cut in the chord which in the case

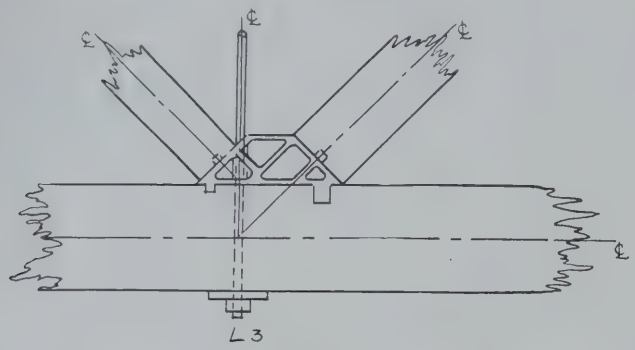


Fig. 12

of the tension chord means just so much larger stick. These lugs should fit tightly into the stick and be reasonably smooth and straight to insure a firm joint. Their thickness should about equal their depth. One of them is made smaller than the other, usually not more than one inch, as its efficiency is limited by the horizontal distance between the lugs. This must be long enough to transfer in shear the portion of the stress transferred in bearing by the larger lug above the bottom of the smaller to the main, unbroken portion of the chord. The lugs are placed a short distance from the ends of the casting to make the ribs in the corners less liable to fail. Failure at this point in poorly designed castings is not at all uncommon. The rods R in the case shown pierce the casting and are held at the ends by a plate P bearing against the chord. Where the rod pierces the casting a thin sleeve is cast about the hole and rod to strengthen this point.

The joint at L^3 is shown in Fig. 12. It should be noticed that while the center lines of chord and vertical and the main diagonal intersect at a point that the center line of the counter does not intersect at this same point. This is done to avoid the use of too large a casting and as the stress in the counter can only be small this eccentricity will not be serious. This point was mentioned in the first article of this series in the November number of The Forum.

The joint at L^0 is shown in Fig. 13. The vertical stick at the end transfers any load which may be applied at the end of the truss to the bearing and it, together with the vertical rods, binds the two chords together making a firm structure. The vertical rods are frequently countersunk into the lower chord so as not to interfere with the bearing. The plate at the end of these rods does not need to be very large. It is at this joint that the most difficult problem in the design of the truss is often encountered. This is the problem of taking care of the shear in the lower chord due to the horizontal component of the stress in the end diagonal. The end diagonal carries the greatest stress of any of the diagonals and it meets the lower chord so near its end that frequently little space is available to take care of this shear if no other provision is made than at the other joints. The distance D, Fig. 13, should be at least 12 times the combined required depth of the lugs otherwise the upper part of the lower chord would shear off from the right hand lug to the end of the truss.

If there is room to extend the lower chord to provide for this it is the most economical way of designing the joint, but where space does not permit, some other means has to be provided. One way is to omit the lugs on the casting and to place under the casting a steel plate with a lug riveted to its top for the casting to bear against and extend the plate back far enough so that other lugs may be put on its under side, notching into the lower chord. When this is done bolts should be placed through the plate and passing through the chord. These bolts should be just to the right of the lugs to prevent the plate from buckling up.

Another way of providing for this shear is to design the casting as shown in Fig. 13 and then run a bent plate around the end of the lower chord

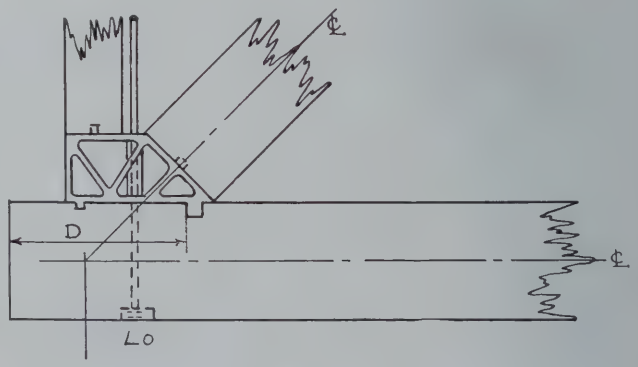


Fig. 13

and along either vertical face of it far enough back to allow vertical lugs to be placed on the plate engaging the bottom chord in a similar way to the top plate already described.

In some trusses it has been found that the chord stress was so great that wood could not be conveniently used for the lower chord which is in tension. In such cases a stick is chosen large enough to take care of the details properly and plates run along the vertical faces of the stick for the entire length being merely a continuation of those described in the preceding paragraph. Channels may be used to advantage instead of plates and sometimes rods have been used passing through angles at their ends, these angles having their outstanding legs reinforced by stiffener angles.

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Business Elements in an Architect's Office

ALMOST invariably the preface of anything written on the subject of business from an architect's viewpoint consists of a sweeping apology to art, followed by the more or less thinly disguised accusation that the average architect is an artist and consequently a helpless entity in the business world. Even where groups of architects meet there is no lack of disparaging criticism as to the average architect's ability to make money, to hold his clients, to manage his organization and to take his logical position in the economic structure of the community.

So much has been said, in fact, that there is no need of additional criticism. We believe that every progressive architect possesses the spirit of the progressive business man and that he is interested in every suggestion and idea which may help in bettering his service and his business methods. We propose, during the year 1921, to give no further editorial consideration to any form of direct criticism but to confine our efforts to the development of constructive suggestions for the architect, individually and collectively. If every member of the profession will also adopt this attitude and seek to place his service and his profession in its rightful position in the business of the community it is logical to believe that architecture will soon stand in public estimation not only as a great art but also in its rightful position as one of the important forms of modern business.

Will there be any sacrifice of art in this development? Think of an artist who produces, in three dimensions of beauty, a building which also functions with machine-like perfection in accordance with the desires of those for whom it has been produced! This is what every architect should strive for—to develop through organization and personal equipment the ability to create buildings in which the elements of art, practicability and economy have been finely considered to produce satisfaction on the part of the client and to form a direct contribution to the community.

Necessity of Organization

It is evident that to achieve this result a number of business elements must be introduced into the daily work of the architect and that his organization should be developed accordingly. At this point it may be noted that practically all types of business have more or less standardized forms of office organization. The average architect's office, however, has never been developed on a scientific plan. The result, as everyone knows, is an unstabilized form of organization with crowded offices in busy times and the payroll cut to the bone when business is slack. It is the purpose of this article, therefore, to correlate and present a few conditions and methods which may offer a constructive contribution toward solving this question of developing an organization for architectural work and maintaining it on a well stabilized basis. Let us remember also that an architectural organization may well be primarily of the one-man type. Here one person may be responsible for many business activities which in the cases of larger offices engage the full time of individuals. It will therefore be of interest to consider the business elements which have a rightful place in the architect's organization rather than to establish functional or personnel charts.

We may commence, therefore, with a broad analysis of modern business requirements from the architect's viewpoint. In setting forth these ideas no claim is made on the score of originality nor are there expressed any fine theories. It has been our pleasure not only to have worked actively in the architectural field during the past few years, which have been years of great change in the profession, but to have discussed these subjects with many successful architects in various sections of the country. Consequently such information as may be set forth here consists of the personal opinions and experiences of men active and successful in their application.

The business elements which affect the development of an architectural organization and its service may be broadly divided into two classifications: (*A*) The business interests of the client; (*B*) The architect's personal business interests. We may, therefore, continue our analysis under these subdivisions.

Taking Care of the Client's Interests

There is one certain way of solving the broad problem of retaining and developing a clientele: to so protect the business interests of the client that he will invariably return when he wants additional work done and will readily recommend the architect who has given such service. What brings the client back—art or business? We know

of thousands of cases of disgruntled clients who never questioned the artistic merit of work done by their architects, but we have never heard of a case of dissatisfaction where all of the business elements of the project had been properly and efficiently handled by the architect. The answer seems to be that the organization and the personal capacity of the architect must be developed to a point where the artistic production of the office is of a high standard (for this the client expects), and where each of the requisite business functions is recognized and properly provided for.

The first, and perhaps the most important, of these elements has its application in the early or interpretative stage when first designs in the form of sketch plans are being prepared. Here it is necessary, perhaps, to create designs which will have artistic appeal from the client's viewpoint, or which at least will be accepted by him on the architect's recommendation. Of far greater practical importance, however, is the interpretation of the functional requirements of the structure in such a manner that the designer shall produce a building or a building group which will be efficient in purpose—that is, a veritable machine in the form of a building which, whether it be for investment, manufacture, storage or some form of commerce, will achieve the maximum of production at the minimum of investment and maintenance costs. Right at this point may be found the stumbling block which has impeded the development of many architects—failure to properly grasp the building requirements of the client.

Certainly an architect cannot be expected to have the capacity of a jack of all trades—he cannot be expected to possess full knowledge of specialized industries and commercial activities. It is not necessary to be a banker in order to design a bank—or a manufacturer in order to plan a factory. It *is* necessary, however, to be possessed of an analytical mind in order to determine and correlate the problems peculiar to the building in question. It is necessary to be possessed of an acquisitive mind, ready to study the problem not only from the architectural standpoint but from the viewpoint of the client's business. In many cases architects fail to appreciate the value of the services of specialists. For instance, how many architects in connection with the designing of office buildings have consulted the renting and managing agents *before* preparing the plans? We were told the other day of the case of one large office building where, after plans had been completed, no fewer than 43 recommendations for practical changes were made by the building managers, necessitating the preparation of an entirely new set of drawings. Again, we may cite the question of insurance rates in a large office building. How many architects ever submitted sketch plans to an insurance engineer for suggestions? Yet when the plans for a large New York office building were taken from the architect's office and submitted for insurance rating the cost given was approximately 24 cents. The owner himself submitted the plans to an insurance engineer under whose recommendations for certain changes, with slight additional structural cost, the rate was reduced to approximately six cents—about one quarter of that quoted from the architect's original plans.

Importance of Analysis

Summing up these points we find that one of the first requirements of an architect's organization, from a business viewpoint, is possession by some individual in the organization of the capacity to see each problem from the client's business point of view. This individual, whether he be the architect himself or someone brought in as part of his organization, must constitute a veritable requirements department, functioning in consultation with the owner and the designer, engineer and other experts to determine through inquiry the business requirements of the design. Only when these practical considerations are fully understood should sketch plans be prepared and presented to the owner—and there should be a definite reason for every detail of the design presented. Naturally, the relative importance of aesthetic and practical elements may be said to vary in direct ratio to the importance of these elements in the ultimate functioning of the building.

Architects who have become specialists in industrial construction have not achieved this result because they designed beautiful factory buildings, but rather because through special design they have cut down the dead load of floors—substituted ramps for elevators—cut manufacturing costs by reducing handling distances and through good design increased lighting facilities, provided better working quarters and recognized the value of properly housing the human, as well as the inanimate, machinery.

We have made a particular point of the importance of having in the organization an individual of quick business perception who will recognize the business requirements of a project and in so doing protect one of the important business interests of the owner. This individual may often have the promoter's turn of mind and can act gracefully as the architect's representative when preliminary discussions of a large building project are under way. Usually the architect who is personally possessed of such ability is highly successful. Just as often, the architectural organization which lacks in this respect continues its work in a small way.

Having discussed the fitting of design to the business requirements of the client, we may recognize another business problem in fitting the ultimate cost of the building to the amount of money available for such investment. Here again we strike a sore point—a reason why many good clients have been lost. This condition has had par-

ticular application during the last few years of fluctuation in building material and labor costs. Fundamentally, we recognize here another direct need which exists in almost every architect's office—more direct field experience—a more practical and direct knowledge of building costs and building methods.

Importance of Cost Estimates

The average owner knows certainly about what amount he is willing to spend on a given building project. It is the duty of the architect, as a building expert, to show him what kind of a building he should have and how large a building of this type he can get for the money he is willing to spend. It is the important function of the architect *to disappoint the client immediately rather than ultimately*, at least as far as the cost of building may be concerned. We are reminded of the famous advertising slogan, "Eventually, why not now?" This certainly applies to building costs and the architect who may gain a reputation of "building within his costs" is also building for the future in no uncertain way.

Of course the reason that ultimate costs so often overrun is largely because insufficient care is given to the important question of estimating. Certainly in the organization, or available to it, there should be an individual, preferably a practical builder, who can really analyze costs. It is true that no man can estimate accurately these days, particularly on sketch plans, but it is equally true that there is no excuse for glaring misstatements of cost. If the architect's organization is not equipped to give preliminary estimates there will always be found dependable and experienced builders whose services may be retained to assist in preparing preliminary estimates. Such services should be paid for on a consulting basis.

Many a successful architect's organization has acquired as a regular staff member a practical builder who acts as field superintendent, estimate checker, purchase order checker, follow up and practical utility man.

Thus far we have considered an architect's organization which has the ability to turn out good design, the capacity for adapting the business requirements of the clients to units of design and the ability to limit the sizes of the buildings to the purses of the owners. All the service an owner can ask in addition to these points is that he shall get the best of materials and workmanship available for the money he entrusts the architect to expend in his behalf.

Organization and Team Work

Here again we find not only a question of organization but of team work within the organization. While the architect, except under unusual conditions, is not called upon to carry out the direct purchasing of materials and hiring of labor, he is of course responsible for the kinds of materials and labor that go into the building. It is his duty to keep thoroughly abreast of developments in the material markets and with new ideas in sanitary and utility equipment. Under his specifications, and subject to his approval, the materials and equipment for the building will be purchased and installed. To show how important one of the larger offices considers the activity of keeping abreast of developments in the way of available materials and equipment we may say that a small department is maintained, the sole business of which is to know of every new idea offering convenience to a guest in a hotel room. Of course this organization specializes in the designing of hotels, but one reason why it has become a great organization has been its close attention to the materials, equipment and methods which the market has to offer for the benefit of its clients.

Every architect, large or small, has the opportunity of studying the market before him at all times. In terms of organization, this means record and reference file clerks. It means the maintenance of an orderly file of catalogs and advertising information as well as a file of precedent in design. It is safe to say that in no group of business offices entrusted with the expenditure of vast sums of money for clients are reference files and records so carelessly maintained as in the offices of most architects. The average architect passes serenely through the bombardment of manufacturers' catalogs—they fall to the right and to the left and seemingly do not affect him. As a matter of fact, the architect cannot be expected individually or through any member of his organization to read every piece of advertising mail matter sent into his office. What is done in many instances—and always should be done—is that all matter descriptive of materials, equipment and methods should be carefully filed for reference when the subject is under consideration. Every member of the organization should recognize the importance of such reference files and should contribute to their proper maintenance by sending to file valuable data obtained from any source. Thus the control of the purchase of materials and equipment will be placed upon a scientific basis of cost and quality comparison. This is of particular importance on a cost-plus project where the architect approves all individual purchases.

Field Supervision

We come finally to the important question of supervision in the field. The relations between the architect, builder and owner offer a complex subject and one affording opportunity of lengthy discussion. For the purpose of this article we may say that one definite need of a practical architect's organization is a dependable supervision department the personnel of which consists of individuals who have had broad experience in actual construction work and who are possessed of sufficient diplomacy and tact to expedite rather

than block progress on a work. It may be remembered also that the owner is pleased to see the architect himself on the ground occasionally. There is today in the average architect's office too great a separation between the designing department and the actual field work. Wherever possible designers should have an opportunity of checking their own work in the field if only for the practical experience thus afforded.

The Architect's Personal Business Interests

We have considered the business forces which should be properly developed through the architect's organization as a protection for the interests of the client. In developing his business the architect must also give serious consideration to his personal interests which include production and overhead costs, the distribution of profits and the maintenance of an office organization in dull periods.

The architectural organization will take one of three forms: complete ownership by an individual, a partnership or a corporation. After serious consideration of the nature of the business it would seem that the best form of organization for the architect is a partnership. The average architect's office, carrying on a professional service business, represents practically no investment or capital value. Consequently the ownership of the business means only a right to a certain division of the profits, carrying also the responsibility of meeting deficits.

Certainly a successful organization of this nature develops a reputation and good will, sometimes of great value. As a rule, however, this value is of an intangible nature and can be passed on in the form of the architect's estate only in so far as the remaining owners of the business may agree to pay certain sums to the estate as compensation agreed upon during the life of the architect in question.

A partnership constitutes an ideal form of ownership in this business for various other reasons. An opportunity is offered for the development of a business partnership in which one member is the architect in fact, while the other may be the business man, the diplomat and possibly the "mixer." An organization of this kind, with junior partners developing different aspects of the business, is the ideal organization. Invariably such an organization functions successfully, and with here and there an exception it will be found that the really successful organizations are built upon this plan.

The question of profit sharing has often been brought up for consideration and solutions of many kinds have been attempted without any striking success as far as we know. There is probably no business which fluctuates so greatly. A busy building season comes and all offices are rushed, the demand for draftsmen becomes acute, and the architect prospers. In 60 days the whole situation may change. Office forces are reduced and draftsmen seek everywhere for work. The principal reason for such rapid fluctuation is of course the fact that two or three large jobs will keep the average organization very busy. The architect's product must be sold before it is manufactured, if we may compare his business to that of a manufacturer.

Methods of Profit Sharing

It is evident that those who share in the profits should share in the losses which arise from time to time. Profit sharing, except among those who actually own the business, should therefore be limited.

The cleverest manner in which the general situation has been met seems to us to be the plan developed in one large New York office. This is a partnership with senior and junior partners as described in foregoing paragraphs. Instead of profit sharing this office has developed another plan which helps greatly in maintaining a strong organization. A share of all profits (about 25 per cent) is set aside regularly in the form of a sinking fund. This fund is used during lean periods to pay the salaries of draftsmen and other employes carried on the regular force. Consequently a position in this office becomes highly desirable as it is known that work will be regular and that a position can be held even through a long lean period. A maximum annual sinking fund credit is established and if the percentage of profit overruns this amount a division among employes is made at Christmas in accordance with length of time of employment and amount of salary.

Another method of developing added interest among employes is the assigning of certain projects to designers and draftsmen who are to receive a percentage of profit netted on the work. This method has the value of enlisting the full interest of employes in keeping overhead costs down and in following the work to a successful conclusion. In many offices the designer carries full responsibility for inspecting the work in the field as it progresses.

Meeting Fluctuating Conditions

In view of the known fluctuation of the architect's business it will undoubtedly be of interest to describe the method of maintaining a balanced organization which has been used successfully for several years by a well known firm of architects. This organization consists of the two partners, who employ directly about ten draftsmen. At times there is being handled through this office enough work to keep 100 or more men busy but the organization is never increased or decreased. The policy of this firm is to let out a large proportion of its work to smaller offices, particularly of the "one-man" type. Arrangements are made with these offices almost as though the owners were draftsmen employed in the office.

Payment is made on a time basis, likewise, and all plans bear the imprint of the controlling office.

This plan has many merits. It is easy for the owners because they have none of the troubles of the fluctuating organization. They can take on any amount of work on instant notice and are never at a loss to know how to build up the working force quickly. Again, work given out in this manner helps the younger architect to maintain his small organization and gives him the same practical experience that he might receive if he were carrying the work on his own account. The architects who control this business report that the work turned out is in every manner satisfactory and that service to the owner is often quicker.

An Example of Organization

As in every line of business the subject of efficiency is of great interest in the architect's organization. Undoubtedly, in most offices there is a large amount of waste effort. Seeking the cause for this we find that it is primarily a matter of improper organization and assignment of duties, and that much time is wasted because of poor filing and record keeping systems.

In one of the most efficiently managed offices we have come in contact with, all work is carefully but automatically routed. This office is organized in several departments or divisions:

1, Executive
2, Contract Department
3, Auditing Department
4, Production Division
5, Construction Division

The work of each Department is thoroughly defined. The Executive, through a system of memoranda, reports and progress charts, has his fingers at all times on the pulse of the work. The Contract Department would correspond to the sales force of a commercial organization. Here a full record is kept of all contact with clients *until a contract is signed to carry out the work.* Then the responsibility of the Contract Department ceases except to call on the client occasionally, and independently of the rest of the office, to make certain that he is happy in his treatment by the office. The Contract Department, needing rough sketches or any data in connection with the closing of contracts for work, gets it through written request to the Executive. Regular executive meetings of department heads eliminate much running back and forth.

After the Contract Department has closed with a client a written outline of requirements is prepared and the Executive orders the work carried out by the Production Division while the contract is filed with the Auditing Department. The Production Division consists of designers, draftsmen and engineers. In the Construction Division are the estimators, superintendents and field accountants.

Having fixed upon requirements all plans are called for at a certain date, an advance progress work sheet having been prepared and posted. Costs and practical field information are given as required, by the Construction Division, and the first draft of working drawings is checked by this Division for practical suggestions tending toward more economical or quicker construction. Similar specifications are checked. Whenever it is deemed advisable the plans are checked by a specialist and it is found that cost saving and better service often result. For instance, if plans are required for a building such as a large public garage, suggestions are obtained not only from the owner but from a recognized expert in the management and equipment of such buildings.

When plans are completed and the work is commenced in the field every assistance possible is given to the builder and to sub-contractors by the practical builders in the Construction Division. Independent progress sheets are maintained and at every point this independent building force is being exerted to save money for the owner. Thus simple, accurate reports can be rendered to the owner as funds are expended and he can at all times have a full record of progress.

The Working of an Office System

In this office all mail is routed by the Auditing Department where the general books and records are kept. The detailed cost records are kept in the Construction Division and audited regularly by the Auditing Department. All manufacturers' literature is sent directly to its classified place in the files and everyone in the office knows that when he is interested in any building material he can find the latest information possessed by the office in its proper place in the files.

This arrangement provides a clean-cut division of authority and responsibility. All business that may come into the office is quickly classified and sent where it belongs. It is either of an executive or a sales nature, has to do with accounts or records, is a matter of design and specification or is relative to a job already under construction. It may be interesting to note here that the Production Division has an inspecting architect visit each project regularly and independently of the Construction Division—thus affording a cross-check on progress.

It must be evident that efficient organization in any architect's office involves a careful study of business requirements and the allocating of various activities in accordance with the size of the organization. The principles of any successful commercial organization may, in part, be applied to that of the architect. Regardless of the size of the organization, if it is to be placed upon a sound, businesslike basis, the first step is to carefully analyze the various responsibilities of the business and to place them with the right individuals, together with sufficient authority to meet them properly.





TWO DETAILS FROM THE COTSWOLD DISTRICT, ENGLAND

PLATE DESCRIPTION

Industrial Laboratory, U. S. Bureau of Standards, Washington, D. C. Plates 6, 7. In this building, of which Donn & Deming are the architects, is maintained an organization of specialists for research and for the testing of materials and appliances used in various industries. The main portion of the building is 60 x 350 with three wings, each 60 x 104, four stories in height and has the form of a letter E. The two courts are roofed over at the first floor level, forming two one-story shops. The floors and structural frame throughout are of reinforced concrete enclosed with walls of brick with Indiana limestone trimmings. Partitions are of terra cotta blocks plastered on both sides; floors have granolithic finish and terra cotta fillers have been placed between the concrete joists, thus providing for flat ceilings.

The center wing of the three is of special construction, forming an open court from the basement to the third floor for installing various testing machines. The ground floor area of the building is about 1¾ acres. Work was begun in February, 1918, and completed in twelve months and at a cubic foot cost figure of less than 30 cents.

The U. S. Army Supply Base, South Brooklyn. Plate 8. In planning these buildings the problem was two-fold: to provide for maximum war requirements of direct rail-to-ship movement and of storage and to provide a terminal which could be advantageously operated for commercial uses later.

The vast structures of concrete which were designed by Cass Gilbert embody efficiency of the highest degree. The buildings include two main warehouses known as Warehouses A and B. The illustration shows one view of Warehouse A which is 980 x 200 and eight stories and basement in height. Both these warehouses are entirely of reinforced concrete of the flat slab type. They are of particular interest to architects for their architectural character which has been achieved without the use of a single moulding or cornice.

The Schwinn Building, Chicago. Plate 9. This structure, of which Walter W. Ahlschlager is architect, affords a striking example of the successful use of concrete in large commercial buildings. In this building, 80 x 600, not a single brick has been used; the concrete construction consists of the structural mass poured in as small sections as the calculated stresses and strains would allow and while the concrete was still green the forms were stripped and the walls rubbed down with pumice stone. Even the sills are of concrete cast at the same time that the spandrels were poured.

The small squares of ornamentation at the head of the first story windows and also under the coping are of cement colored with a red pigment and were cast in a mould on the site and then nailed to the inside of the forms so that the concrete could be poured around them. Projecting ornament is of terra cotta. The entrance at the end of the building, shown in the illustrations, is entirely of concrete.

Buildings for Jackson Mills, Nashua, N. H. Plates 10, 11. The importance of good design in manufacturing structures is shown in the views of mill and office buildings designed by Lockwood, Greene & Co., Engineers.

The design shows a classic pylon treatment; the lower story has a rusticated surface which gives an appearance of solidity and strength to the mass of the building. All architectural character is the result of studying proportions of the structural parts; the entire building is of reinforced concrete, the exterior finish being had by rubbing with white cement. The lines are extremely simple but to relieve their severity window sashes have been painted an olive green which gives a pleasing contrast to the gray of the concrete. The office building is in keeping with the mill in design but it is of terra cotta blocks stuccoed, inasmuch as this construction proved less expensive in the small building.

Offices of the New England Power Co., Worcester, Mass. Plate 14. This building, of which John Barnard is architect, shows an excellent handling of a problem which is rarely so successfully solved. A structure which is really a business building intruding into a community given up to residences is only too often the entering wedge which begins the process of impairing property values.

In this instance, however, a business structure has been made to resemble a residence which is a distinct asset to the locality and the interior has been planned to offer the maximum in the way of convenience for the purpose in view. Each floor consists of one large open office space with a vault and a toilet upon the lower floor.

Branch Fire Station for City of Salem, Mass. Plate 15. Waterstruck brick laid in Flemish bond has been used for the walls of this fire station of which Frank S. Whearty is the architect. The foundation is concrete and construction of the first floor is of steel framing with concrete slabs with steel I beams and wooden joists for the second floor. The roof is of wooden rafters. Sills, imposts, keystones and cornice are of limestone. The hose chute is just outside the front pier and in the basement are the hose drying racks and a drying room for clothes.

House of Philip P. Barber, Tenafly, N. J. Plate 16. The economy of planning a house of small or moderate size within a rectangle is, of course, well known but it is sometimes difficult to build within a form so restricted and yet avoid a box-like appearance.

The illustrations and plans show a house of which R. C. Hunter & Bro. are architects. Although the house covers an area of only 26 x 40 the plans show nine rooms of excellent size and three baths.

The exterior of the house is treated in a very simple manner, the emphasizing of its strong horizontal lines giving it a somewhat low appearance which brings it into proper relations with its elevated site.

EDITORIAL COMMENT

What Does 1921 Promise for Architects?

THIS question is undoubtedly in the mind of every architect. With each recurring commission laid aside for more favorable circumstances he has visualized the better opportunities of 1921 and taken new courage. Is there reason now to consider his optimism justified? The new year is indeed the hope that has kept the building industry alive through these many months of increasing depression. The new year is now confidently expected to dispel a large measure of that uncertainty which has been a retarding force ever since 1914.

In the last few months we have seen conditions governing general business undergo a vast change. The abnormal period we have passed through was purely the result of the war—and as the war itself was of greater extent than the world had before seen and without precedent, so too was the economic disturbance following it incapable of being judged by the precedents established by other periods of readjustment. The most clever minds of the country were unable to foresee the suddenness with which the change in sentiment and business relations was to take place.

The new year finds us in the midst of readjustment, facing new conditions with the positive assurance that those of the last year will not return. We have by no means reached a period of stabilization; the reaction from absurdly high price levels has been so great and liquidation so rapid that the present market values of many commodities have gone below the actual cost of production. There will without any question be an upward swing to the curve as soon as public confidence is restored but it will be a few years before any permanently stabilized level is reached. The outstanding advantage of the present situation is the entire absence of any fear of a money panic. The only requirements for industrial and commercial prosperity that we lack are adequate purchasing power of the public and the buying spirit resulting from general confidence.

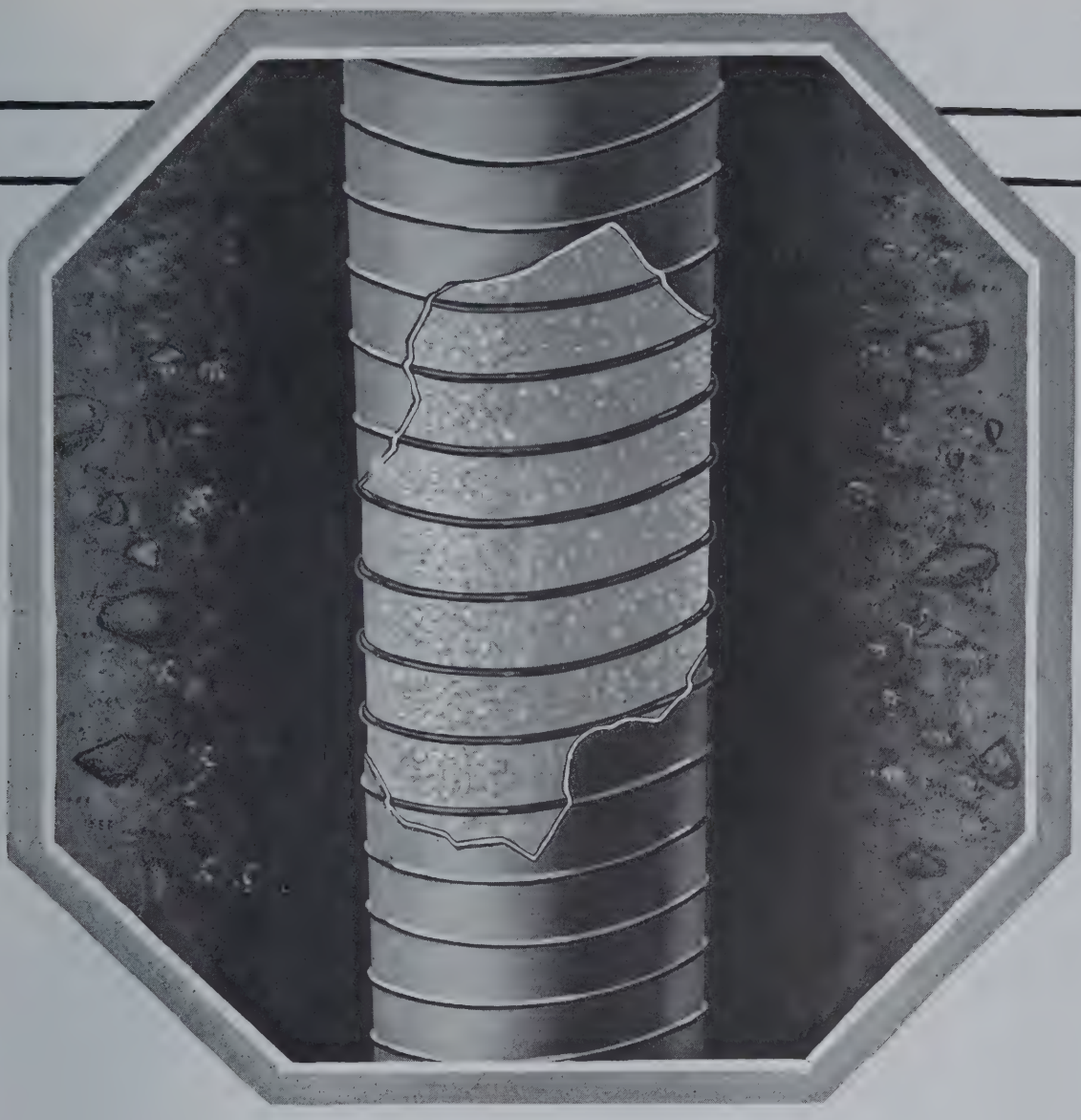
Promise of better things may be taken from the fact that in spite of great inactivity we enter the year 1921 on a sound *deflated* basis. Business of practically any character may now be undertaken with assurance of success whereas in the past years the most careful attention was necessary to provide means of meeting excess costs through immediate and large profits if failure was to be avoided. In building construction very little of that now nearing completion will suffer because in the great majority of instances leases producing enough income to reduce the inflation in a few years were secured in advance of construction.

The country is everywhere, and in all types save possibly industrial work, greatly underbuilt. Housing presents the outstanding shortage and this must soon go ahead under private initiative or the increasing population will make governmental aid necessary. It is estimated that 3,340,000 houses must be built within the next five years if the ratio of 100 houses for 115 families that existed in 1915 is to be regained. In 1890 there were 110 families to every 100 houses; today the average is 121 families to every 100 houses. If residential building in future proceeds no faster than in 1920, at the end of five years there will be 130 families to every 100 houses.

An illuminating index to the amount of building that has been postponed because of unfavorable conditions is given in some statistics prepared by the F. W. Dodge Co. In normal years, the total estimated cost of projected work is about 50% in excess of the amount of contracts actually awarded. In 1919 the excess of contemplated work over actual construction was 68%, and in 1920 the abnormally high figure of 92%. The deficit of building has, therefore, steadily increased.

Active steps to supply this deficiency will be taken when public confidence is restored through satisfaction that a reasonably stable price level has been reached. This condition will not occur immediately. It was several months after the armistice before construction proceeded to any extent. It was delayed until there existed a general feeling that post-war prices were going to remain constant for a period of years. With the start of a construction program in 1920 that promised to eclipse all records prices began to climb. The greed for profits and power by both labor and capital was so great, however, that it proved a boomerang and our inflated prosperity fell of its own weight. The sordid disclosures of the investigation of building practices in New York will have a wholesome influence and we may look for moderation in adjusting prices to demand in the next period of activity.

It is generally expected that the spring months will see prices of building materials stabilized on about the 1919 levels and that with the public realization of stabilized conditions, construction will start in fair volume. With the beginning of activity a healthier tone will be given conditions generally, because prices will become firm and possibly advance slightly, removing the deterrent effects of a falling market. Architects are at the threshold of a period of development in which the extent of their participation will be measured only by their ability to serve.



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Manufacturers' Catalogs and Business Announcements

National Building Granite Quarries Association, 31 State Street, Boston, Mass., "Architectural Granite" (8½ x 11 ins.). 16 pp.

In deciding minute technicalities which are bound to arise in the use of materials for prospective buildings this booklet contains the necessary points in regard to granite. Not alone are the properties and possibilities made clear but several correct reproductions are shown by the three color process engraving method whereby all natural tints of the stone are shown. Three full page details give jointing, bonding, backing, bedding, dressing, etc. One plate in particular of interest as the means of cutting down expense on a specific structure is shown in each aspect. An explanation of finish from rock-face to polished gives an understanding that will clear up many a wrong impression in regard to results of treatment. Although this treatise is reprinted from Sweet's Catalogue, it makes a handy record available to all designers. With its outline for specification writing there appears to be more matter than the familiar big book contains.

American Radiator Company, 816–822 S. Michigan Ave., Chicago, Ill., "Engineer's Data—Vento Heaters" (8 x 11 ins.). 48 pp.

As the name implies this book is given to tables, charts and piping diagrams for heating engineers and architects. The Vento type of section is chiefly for blower heating and is adaptable to a variety of tier installations with a wide margin of space saved over pipe coils of similar capacity. The tables contained have been found extremely valuable for laying out systems in buildings of public or semi-public nature. It is evident that everything has been included for arranging indirect heating requirements.

The Bishofric Manufacturing Co., 301 Este Ave., Cincinnati, Ohio, "Portfolio of Working Specifications" (8½ x 11 ins.). 17 pp.

The introductory text to the eleven detailed plates presents the Bishopric Stucco and Plaster Base in its various types and uses. Its application is fully explained and general specifications for the most economical use are given prominence. Bishopric Sheathing is also taken up and tests of both products are made public. The detail sheets are drawn to show materials combined with sheathing, stucco and plaster board. The majority of details show exterior and interior trim in connection with the above products. All kinds of construction are given and many novel and practical advantages of use for work inside and out as groined vaults, coves and cornices in ceiling work are brought out.

ANNOUNCEMENTS

Mr. G. Lloyd Preacher, architect and engineer, wishes to announce the association with him of Messrs. George Harwell Bond, J. F. Wilhoit and Nicholas Mitchell to practice under the firm name of G. Lloyd Preacher & Co., with offices at the Healey Bldg., Atlanta, Ga., and the Masonic Bldg., Augusta, Ga.

Mr. Edward F. Stevens, 9 Park St., Boston, Mass., and of the Canadian firm of Stevens & Lee, announces that Mr. Frederick C. Lee of 92 Charles St., E., Toronto, Canada, who has had charge of the Canadian office, will in future be associated with him in the United States practice under the firm name of Stevens & Lee, but will as heretofore be located at Toronto.

Mr. R. S. Tyson and Mr. H. N. Foster announce that they have taken over the office of Mr. J. M. King and will practice architecture under the firm name of Tyson & Foster, with offices in the Woods Building, Ashland, Ky.

Mr. Clinton Paine Greer announces the opening of offices temporarily at 2209 Roslyn Ave., Baltimore, Md., for the practice of architecture. Manufacturers' catalogs and samples requested.

Mr. Berthold G. Werner, architect, formerly connected with the office of Emery Root, architect, is about to open a new office in the Proctor Building, Yonkers, N. Y. Manufacturers' catalogs and samples requested.

Mr. Frederick W. Carlson, architect, announces the opening of an office at Annapolis, Md., after January 1, 1921. Manufacturers' catalogs and samples requested.

The Graver Corporation of East Chicago, Ind., manufacturers of steel tanks and general plate construction, oil refinery equipment, water softening and purifying equipment, announces the opening of branch offices in the following cities: 280 Broadway, New York City; 62 Conestoga Bldg., Pittsburgh, Pa.; 1001 Gloyd Bldg., Kansas City, Mo.; 220 Gwynne Bldg., Cincinnati, Ohio; 314 Nicholas Bldg., Toledo, Ohio; 312 Balboa Bldg., San Francisco, Calif.

THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 2

CONTENTS for FEBRUARY 1921

PLATE ILLUSTRATIONS

	Architect	Plate
TOWER HILL SCHOOL, WILMINGTON, DEL.	*Brown & Whiteside*	17–20
MEMORIAL TABLET TO JOHN PIERPONT MORGAN, METROPOLITAN MUSEUM, NEW YORK, N. Y.	*Paul Manship, Sculptor*	21
"SURPRISE VALLEY FARM" FOR ARTHUR CURTISS JAMES, ESQ., NEWPORT, R. I.	*Grosvenor Atterbury and Stowe Phelps*	22–24
HOUSE OF REV. WILLIAM M. CRANE, RICHMOND, MASS.	*Kilham & Hopkins*	25, 26
BUILDING FOR THE WEBER MOTOR CAR CO., ST. LOUIS, MO.	*Preston J. Bradshaw*	27
BUILDING FOR C. C. WHITTEMORE, CATERER, BOSTON, MASS.	*Allen & Collens and J. Lawrence Berry*	28
JEFFERSON SCHOOL, SYRACUSE, N. Y.	*James A. Randall*	29
SMITH SCHOOL, SYRACUSE, N. Y.	*James A. Randall*	30
HOUSE OF A. LEO EVERETT, ESQ., 70TH STREET, NEW YORK, N. Y.	*Walker & Gillette*	31, 32

LETTERPRESS

	Author	Page
COVER DESIGN, CHATEAU OF ANJOU, FRANCE Drawn by O. R. Eggers		
THE EDITORS' FORUM		47
CHURCH DOME, MEXICO		*Frontispiece*
IMPRESSIONS OF THE COLONIAL ARCHITECTURE OF MEXICO	*Walter H. Kilham*	39
TOWER HILL SCHOOL, WILMINGTON, DEL. Brown & Whiteside, Architects		45
EARLY AMERICAN DOMESTIC ARCHITECTURE V. The Sir William Johnson House, Fort Johnson, N. Y. Measured drawings by Wm. D. Foster and Lewis E. Welsh		47
FARM BUILDINGS OF ARTHUR CURTISS JAMES, ESQ. Grosvenor Atterbury and Stowe Phelps, Associated Architects		55
DEPARTMENT OF ENGINEERING Terra Cotta Roofing Tile, Part I, Alfred Lo Cascio Truss Design and Details, Part IV, Charles L. Shedd, C.E.		59
MINOR ARCHITECTURE DEPARTMENT An Automobile Sales and Service Building Preston J. Bradshaw, Architect		65
DECORATION AND FURNITURE DEPARTMENT The Industrial Arts Exhibit at the Metropolitan Museum Interesting Rooms of a Remodeled Colonial Dwelling		67
BUSINESS AND FINANCE DEPARTMENT The Owner's Duty to the Architect		71
PLATE DESCRIPTION		75
EDITORIAL COMMENT		76

ALBERT J. MacDONALD, Editor

Published Monthly by

ROGERS AND MANSON COMPANY

142 Berkeley Street, Boston 17, Mass.

Advertising Department, 103 Park Avenue, New York

Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat

Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.

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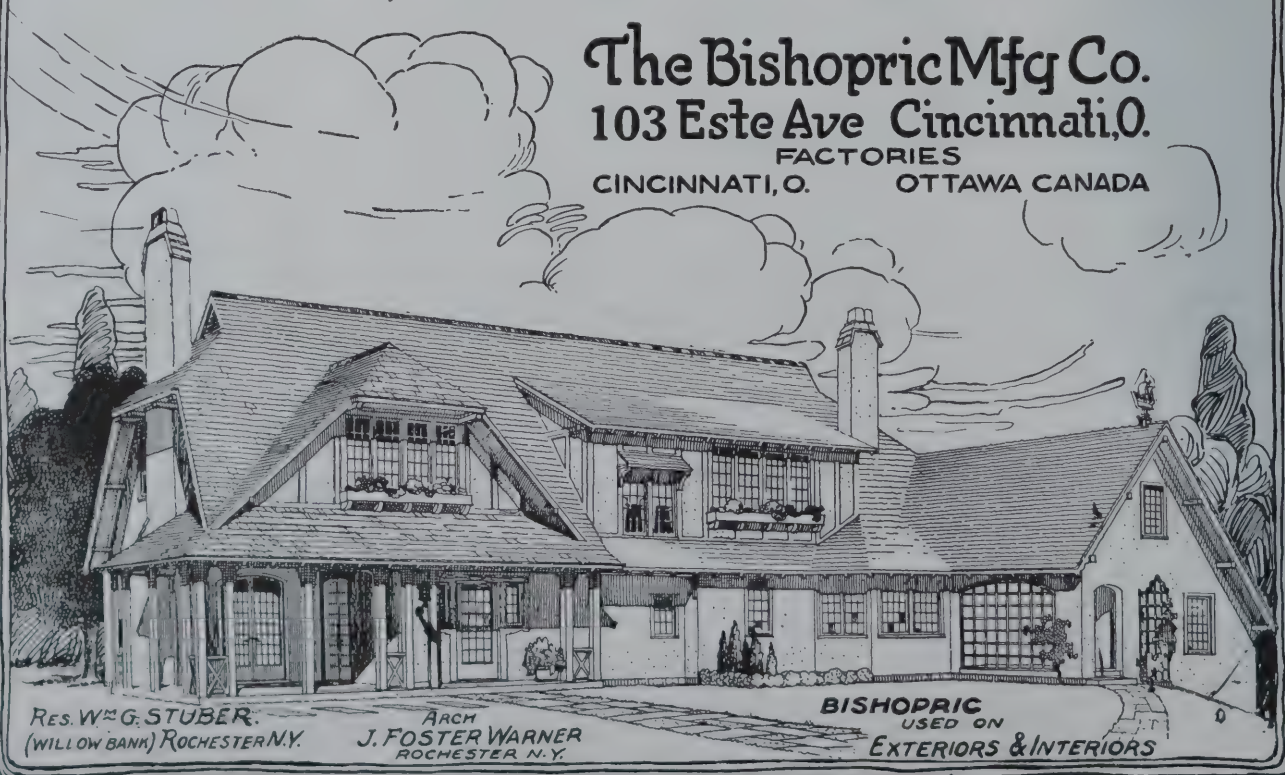
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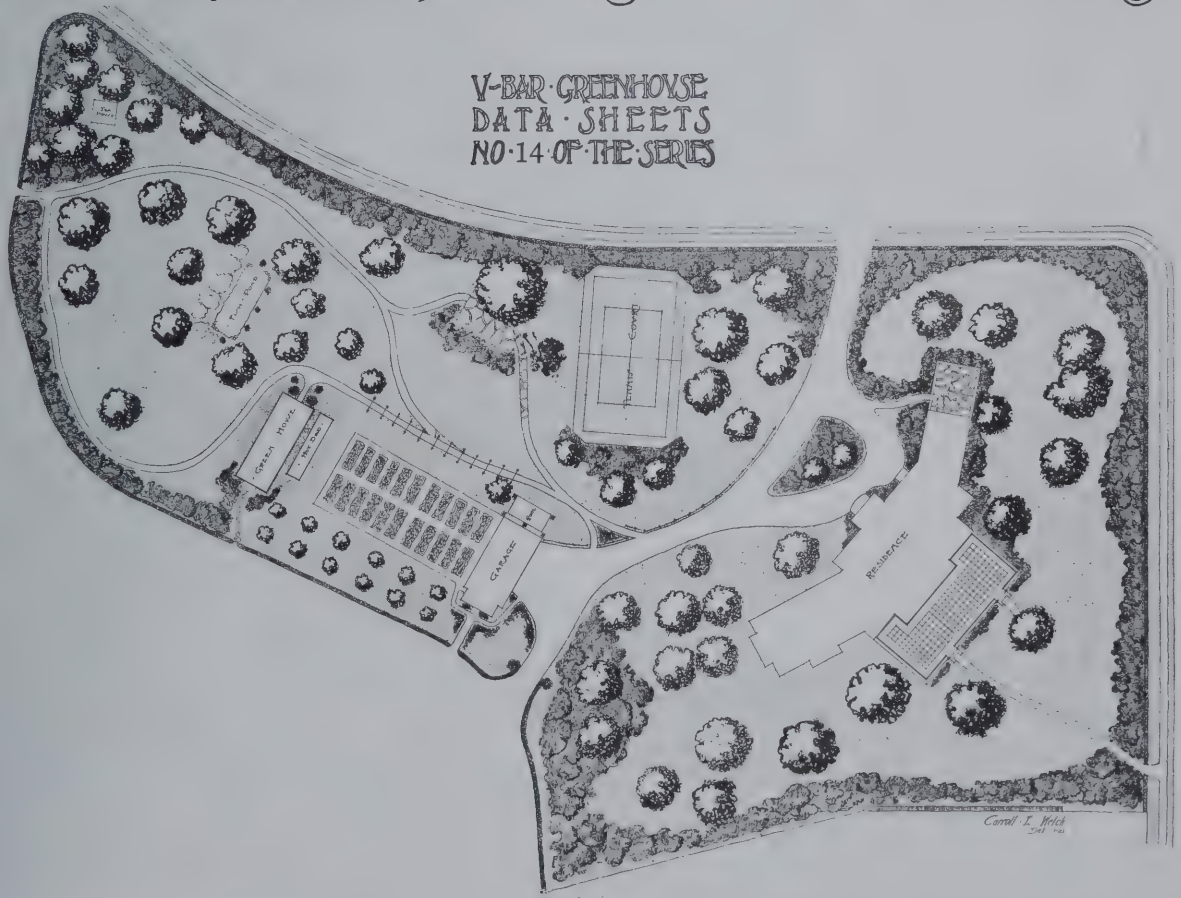
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Manufacturers can ship promptly, and
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Had such a policy prevailed throughout the period since the armistice, the difficulties experienced in carrying on construction work during 1920 would have been considerably lessened, if not entirely avoided. Contracts for an enormous peace-time construction program were awarded too late in 1919 to permit of completion during that year. This deferred demand came upon an unprepared market and was carried over into 1920, only to be still further hampered by the large construction program of that year. Not only was the greater portion of 1919 lost, but the construction industry impeded by railroad congestion was thrown into such turmoil in 1920 that only a cessation of contract letting could clear the situation.

Five years' accumulation of construction still awaits contract letting. If such contracts are awarded early in 1921 and construction proceeds in an orderly, intelligent and efficient manner, material manufacturers and railroads can meet the situation. Unless this plan is followed, difficulties even more serious than those of 1920 can be expected. You share with others a measure of responsibility in preventing a recurrence of such a situation.

Due to handicaps beyond its control, the cement industry operated at only approximately 70 per cent of capacity during 1920. Notwithstanding earnest and sustained effort on the part of cement manufacturers, many users were disappointed due to their inability to get shipments when and where wanted.

Transportation is the neck of the bottle regulating capacity of industry and distribution of its products. Cement is now available everywhere. Manufacturing capacity has always been equal to any calls made upon it unless demand has been concentrated within comparatively short periods.

There's no time like Now to move materials.

PORTLAND CEMENT ASSOCIATION

Atlanta				San Francisco
Chicago	Detroit	Los Angeles	Parkersburg	Seattle
Dallas	Helena	Milwaukee	Pittsburgh	St. Louis
Denver	Indianapolis	Minneapolis	Portland, Oreg.	Vancouver, B. C.
Des Moines	Kansas City	New York	Salt Lake City	Washington

Start construction early-Move materials NOW

THE EDITOR'S FORUM

ARCHITECTS' REGISTRATION

WITH the formation of the National Council of Architectural Registration Boards, there is promise that standardization of requirements for registration may be effected. Of immediate concern is reciprocity between states having license laws, and architects interested in reciprocal transfer can obtain information on the subject by addressing the National Council of Architectural Registration Boards, 3230 W. Monroe St., Chicago.

LEBRUN SCHOLARSHIP AWARD

THE jury in the LeBrun Scholarship Competition for 1920–21, conducted by the New York Chapter A.I.A., has made these awards:

Traveling Scholar	Oliver Reagan, New York.
First Honorable Mention	Robbins L. Conn, New York.
Second Honorable Mention	Edward S. Lacosta, New York.
Third Honorable Mention	Charles J. Irwin, Brooklyn.

A.I.A. EDUCATION FUND

THE following announcement of a gift to the Institute for architectural education was recently made to the President and Board of Directors.

"The undersigned is privileged to say that a friend of the profession desires through the Institute to make a contribution to architecture. His wish is to add some encouragement to young architects in pursuing the long and arduous training necessary to prepare them for successful practice. The donor proposes to give to the Institute in installments a sum amounting to $25,000 which shall be known as an education fund, the income of which shall be used at the will of the Institute for the benefit of the profession of architecture. The giver suggests that the Board of Directors at its present meeting appoint a committee which shall under the direction of the Board and in co-operation with the American School at Rome, establish and administer one or more traveling scholarships for which $1,500 per year will be made available."

PARIS ARCHITECTURAL EXHIBIT

BY invitation of the Société des Artistes Français, of which M. Laloux is President, and in collaboration with the French Department of Fine Arts, there will be held an exhibition of American Architecture in the Salon des Artistes Français, in Paris, opening May 1 and lasting about two months.

Architects desiring to exhibit drawings or photographs are requested to communicate with Mr. Julian Clarence Levi, Secretary of the Committee, 105 West 40th street, New York.

BOOK NOTES

THE HANDBOOK OF ARCHITECTURAL PRACTICE

AN exceedingly valuable contribution to the working library of the architect is "The Handbook on Architectural Practice," newly published by the American Institute of Architects, Octagon House, Washington, D. C. As announced in the preface, this book does not aspire to treat of architecture as an art, nor does it deal with construction, engineering or the choice of materials. We may quote here its interesting and important purpose:

"The architect, by expressing his ideas in forms and words of exact contractual significance, by controlling machinery for their embodiment, by giving just decisions between conflicting interests, by bearing himself as worthy of his high calling, gives to his art the status of a profession. It is with that aspect of the architect's work, professional practice and its servant, business administration, that this handbook is concerned."

Chapters are published on these various subjects:

I — *The Architect and the Owner*
Treating of the forms of architectural service; methods of payment; agreement between owner and architect; employment of engineers; the owner's duties and other important business phases of this relationship.

II — *The Architect's Office*
An outline of office organization, plan and equipment, with information on cost accounting and bookkeeping.

III — *Surveys, Preliminary Studies and Estimates, Working Drawings and Specifications*

IV — *The Letting of Contracts*
Important and interesting information and opinions are here given regarding the fee plus cost contract and the separate contract system.

V — *The Execution of the Work*
Information on notifications; progress and value schedules; superintendence; changes in contract amounts; applications for payment and certificates of payment.

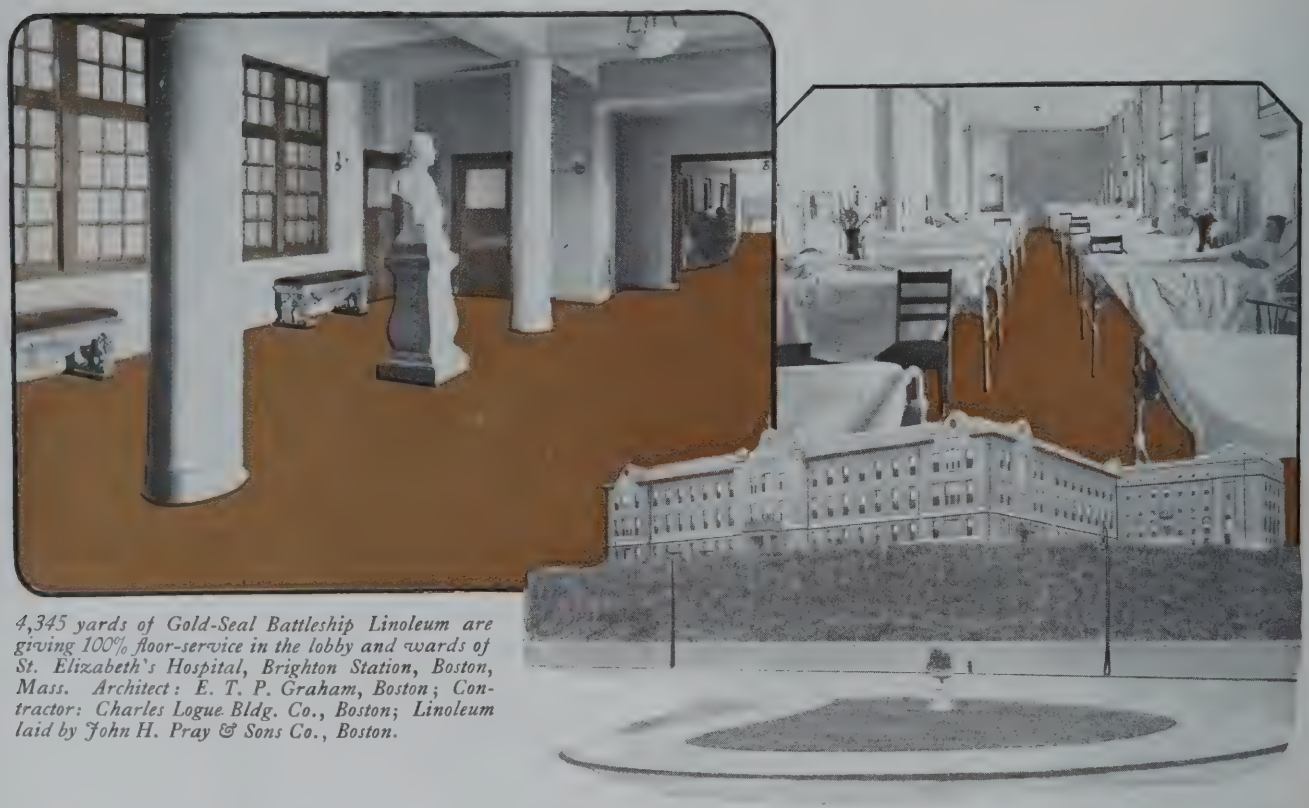
VI — *The Architect and the Law*
License to practice; service agreements; liability to owner, contractor and others, and to know the law; mechanics' lien laws, partnership agreements and other important legal points.

VII — *Documents of the American Institute of Architects*
A complete presentation of a number of standard forms of documents developed after careful investigation by the Institute.

While it is true that business administration is a servant of professional activity it is equally true that many architects have failed to take proper advantage of this service. Consequently, avoidable misunderstandings have arisen and disappointment on the part of the owner or the architect has developed. The information given regarding the business relationship of the architect and the owner, defining clean-cut methods of developing mutual confidence and understanding before and during the course of the work, is consequently of direct value.

Stress is laid on the importance of preliminary estimates and suggestions are made as to methods of close approximation. The subject of quantity surveying is discussed in detail. We are particularly interested in finding in Chapter 23 a timely discussion of the "straight" and "fee plus cost" forms of contract.

The handbook is dedicated "To the memory of Frank Miles Day, of Philadelphia, under whose constructive and able leadership this handbook was undertaken and written and whose untimely death prevented him from carrying it to completion."



4,345 yards of Gold-Seal Battleship Linoleum are giving 100% floor-service in the lobby and wards of St. Elizabeth's Hospital, Brighton Station, Boston, Mass. Architect: E. T. P. Graham, Boston; Contractor: Charles Logue Bldg. Co., Boston; Linoleum laid by John H. Pray & Sons Co., Boston.

Floor-Covering that is Built for Comfort—

GOLD-SEAL Battleship Linoleum combines with its toughness and durability the comfort of resilience. Comfort not only for the sick, with its restful brown tone and sound-deadening quality, but for the busy nurses and doctors who spend the greater part of the day on their feet.

The officials of St. Elizabeth's Hospital of Boston are using this floor-covering not only in the lobby for its restful dignity, but also in the wards for its durability, quietness and sanitary advantages.

The same qualities of restfulness, durability, ease of cleaning and general serviceability have made *Gold-Seal* Battleship Linoleum the choice of executives the country over for auditoriums, theatres, industrial structures and office buildings.

The fact that *Gold-Seal* Battleship Linoleum overtops the rigid standards of the U. S. Navy, and the added factor of the unequivocal Gold-Seal Guarantee, makes it a certain investment in floor-covering satisfaction.

Every yard is sold on the basis of "Satisfaction Guaranteed or Your Money Back."

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Gold-Seal Cork Carpet is especially made for those places where absolute silence is desired. It is springy, as noiseless and comfortable underfoot as the pile of a heavy woven rug. Obtainable in restful shades of green, brown and terra cotta—with polished or unpolished surface—10 shades in all. Of course it, too, is guaranteed.

Write our nearest office for further information, specifications for laying and samples of these quality floor-coverings.

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"Impressions of the Colonial Architecture of Mexico"

CHURCH DOME, VIRGIN DEL CARMEN
SAN LUIS POTOSI, MEXICO

The
ARCHITECTURAL
FORUM

VOLUME XXXIV FEBRUARY 1921 NUMBER 2

Impressions of the Colonial Architecture of Mexico

PART I

By WALTER H. KILHAM

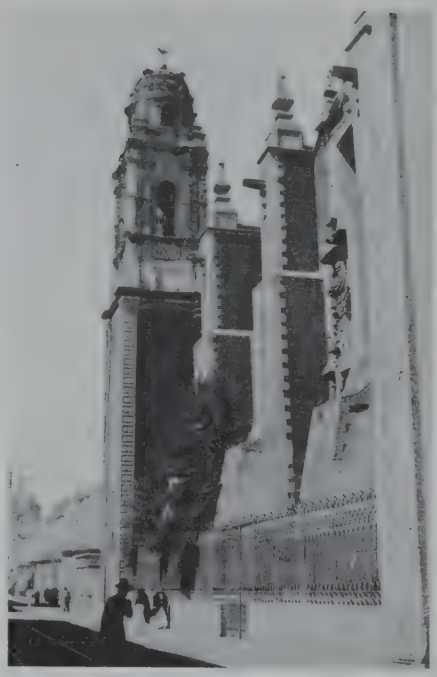
THE south bound train jogs briskly along over a yellow, cactus-sprinkled plain which in the distance sweeps up in vast dull green stretches to a range of towering and jagged mountains, gashed by enormous canyons and circled with floating clouds. Half a mile ahead, intermittently visible around the long curves of the track, is the little train of soldiers—two box cars and an engine—loaded with ragged *Constitucionalistas*, a little short of shoes and uniforms, but long on well filled ammunition belts, who are supposed to protect us from the quite possible raids of the irrepressible roving bandits of the country. Here and there along the track are the adobe or brush-built huts of the native folk, populous with liquid-eyed, brown cherubs, one room for everybody, with possibly an annex for the donkey, and topped with rows of bright orange gourds and squashes. Perhaps in the middle distance a slender, tiled bell tower rises over the white buildings of a *hacienda*, half sunk in masses of green foliage. The stainless sky of perfect azure arches overhead. There is an impression of space and freshness—an almost virgin country ready for exploration and development. Suddenly, as the train rounds a small rise of ground, a magical change of scene is disclosed. Spread closely along a narrow valley lie the huddled pink and blue houses of a populous, old world city. Across one end stride the massive arches of a great aqueduct, while above it, easily dominating the surprising picture, rise the mighty buttresses and domes of an ancient cathedral—massive, timestained and arrogant, defying the inquisitive stare of the Yankee traveler with its air of confident and domineering supremacy. Such, in a paragraph, is a composite impression of Mexico in 1919—a land of dramatic contrasts of old and new, of savagery and civilization, not separated by hundreds of miles, but closely mixed together, the cultivated Latin and the ignorant Indian jostling each other whether in crowded market places or on far spreading plains.



Chapel at Amecameca

Americans who have come to regard Mexico as peopled wholly by roving bands of bandit horsemen, its towns mere collections of adobe huts, without institutions, traditions or history, would do well to remember that while the colonies of Virginia and Massachusetts Bay were nothing but straggling groups of rude log cabins, whose people passed their time in a bare struggle for existence, the royal province of Mexico had been in existence for a good

century, and its cities already contained splendid palaces, magnificent churches, colleges, aqueducts and bridges of solid masonry, while the arts of printing, metal working, bell founding and others had long been advanced to a high state of perfection. The Spanish invaders, who effected their conquest in 1519–20, immediately began a systematic colonizing scheme which, like all Spanish colonization, was a model of its particular kind. Ship after ship brought scores and hundreds not only of priests and soldiers, but architects, engineers and skilled artisans of every sort who, utilizing the abundance of native labor which was at hand, razed the cities of the Aztecs and on their ruins began the mighty structures which are now the wonder of every visitor to the Republic of Mexico.



Tower and Buttresses, Mexico City

As has been the case only too often in other places, the country's wealth has been the fateful cause of most of its own misery. Those who deride Mexico's unhappy plight today, free and independent for a century without having ever been able to establish a stable government or take an honored place in the family of nations, ought to remember that never, from the days of Cortez to the present, have any considerable number of foreigners entered Mexico with the idea of helping the country even to the simple extent of becoming useful and industrious citizens; whether the invaders were Spanish, French or American, the basic object was the exploitation of the nation's natural resources of whatever product was most coveted at the moment. Any visitor to a strange land brings away about what he takes in, and one who goes to Mexico for the purpose of enjoying the many delightful features of the country, instead of criticising its institutions, will find much that is pleasing and indeed worthy of imitation, while the architect, with his mind trained to the reception of the pic-



Portal of Cathedral, Mexico City



Church of Vera Cruz, Mexico City

torial and beautiful, will find the country a veritable treasury of brilliant color, exuberant detail, and noble outline and mass.

For a day previous to reaching the frontier the south bound traveler is treated to a panorama of the dejected streets of Arkansas villages, deep in mud, the promenade of inquisitive brown spotted hogs, and the cheap frame shacks of Texas prairie towns—some right side up on their legitimate foundations and others upside down in the distance, wherever they may have been deposited by the playful breezes of the southwest. Once across the river, however, even the rather disreputable border town of Nuevo Laredo is at least built of solid masonry and encloses in its midst a clean, well kept and much used park with the inevitable Mexican tin band stand which even so discriminating a visitor as Flandrau admits one eventually begins to like.



Cathedral Dome and Transept

The intent of this article, as requested by the Editor, was to adhere closely to the technical discussion of Mexican architecture during the viceregal period, but no one with any temperament at all can succeed in keeping the architecture, scenery and people of Mexico entirely separated. Mexico is essentially a pictorial country, not picturesque—for I abhor that word—but a place where everything at all times composes itself into a picture, frequently, perhaps, a chromo with a good deal of "jazz" in the coloring, but still a picture, and even if the inimitable Flandrau says that everybody in the republic looked to him at first like a homemade cigar, he himself immediately admitted that among all classes of Mexicans there is an extraordinary amount of beauty which forms an intensely diverting adjunct to the architecture. For Mexico has a real architecture which is well worth investigation and which, with the now realized advent of peace, must soon become a



Cathedral and Sagrario, Mexico City

favorite study for American architects and designers.

The architecture of the colonial period in Mexico, as might be expected, derives its general style from that of the corresponding period in Spain, the mother country, and in some notable examples follows precedent very closely. The salient features of Spanish renaissance work are in general the sharp, even theatrical, contrast of highly enriched areas with broad expanses of absolutely plain surfaces, and the enclosing of the enrichment around doorways within definite and well defined boundaries. Both of these features are undoubtedly the result of the Moorish influence in Spain, and both were transferred to Mexico in their entirety. The churches and palaces of the new provinces also inherited in full measure the strongly dominating effect of the churches of the old country, combined with a sort of swaggering expression which, in the palaces especially, replaces the cheerful, domestic aspect of a French or English manor house. In fact, the feeling of confidence and strength is everywhere apparent in this early work. Even among all the intricacies of the most rococo designs, the mouldings are firm in scale—never weak or uncertain—and the carving is brilliant and strong. The *cimborio* of the Spanish church develops in Mexico into the dome which, in its half-orange form, was multiplied over the crossings of churches in astonishing numbers. These domes



Doorway of Sagrario, Mexico City

are built of solid masonry, and usually topped with lanterns and charmingly decorated with windows and buttresses. So numerous are they that one begins to think that the builders must have experienced a real pleasure in their construction and preferred them to any other form of roofing. The old church of Atzcapotzalco, for example, has five domes of large size besides various small ones, and this church is not an exception in any sense. From plain and massive bases rise the great church towers, topped with highly enriched belfries, packed with ancient and melodious bells, and capped with little domes of blue and yellow tiles. The decoration of buildings by tiles is peculiarly Mexican and is a beautiful feature which would merit a chapter by itself. The art of manufacturing glazed tiles and faience was brought to Puebla by potters from Talavera in Spain and carried to a high degree of perfection. The blue, yellow and white tiles were used for the coverings of domes, towers and walls of buildings with indescribably charming results which no photograph can reproduce. Even so little known a building as the *Casa de los Azulejos* in Mexico City well deserves to be the subject of an architectural monograph, although its delicate coloring is inimitable by modern "quantity production" methods.

The dry vocabulary of technical description fails when one comes to the question of the carved



Tiled Domes from the Roof Tops, San Angel

church fronts and palace portals which exist in great profusion. It is true that a family likeness runs through all, that the eye eventually tires of the curls and twists of the mouldings and the eternal corkscrew columns and frequently crude details of the niches and arches which decorate the facades, the offspring of the baroque and Churrigueresque fantasies of old Spain; one begins to formulate lines about "crooked architecture for crooked people" and to draw hasty conclusions as to the morality of the originators of these sinuous designs. But one quickly perceives that the detail of the doorway is only a small part of the picture. The massive buttresses of severest simplicity rise grandly on either side, colored in the most delicate tones of pink and yellow, their plain surfaces contrasting with and emphasizing the enrichment of the center; the ancient stone pavement leads to a richly carved door which alone would repay a day's study; adjoining may be a spacious old arcade or ancient garden wall topped by cypresses three centuries old.



Dome and Lantern, San Angel

The peaceful tide of semi-Indian traffic flows quietly along the narrow street, perhaps to a carved fountain which was flowing when New York was not even a trading post, and any article made of stone, except perhaps an Indian battle axe, would have been non-existent in the English colonies. It is difficult to realize Mexico's age.

The old Spanish architects were strong on line and proportion, and their construction was of the best, but color everywhere becomes the keynote of their work. This color, fresh, brilliant and sparkling in the crystalline air, may be intentional, as in the domes of glazed tiles at San Angel and the walls of tender pink *tezontle* at Guadalupe Hidalgo, or it may be accidental, as in the stucco facade of the old church of Xochimilco, where an undertone of lemon yellow is overlaid by a later tone of most delicate pink, mellowed and seasoned by the weather. Even the peons have a strong eye for color which they manifest, when possible, in their surprising combinations of costume; if they are unable to acquire a magenta scarf or a pair of yellow drawers to wear outside their trousers they will make up for it by carrying a basket of oranges or ripe tomatoes; at any event the color is there in some form.

The most important and probably the best known ecclesiastical building in the country is the cathedral of Mexico City whose size alone (length of inside walls 387 feet, width 177 feet, height 179 feet) entitles it to rank with churches of the first order, and as a matter of fact I think that the style and dignity of its main facade are easily able to qualify it as one of the finest renaissance churches in the world. One may quibble at the great inverted consoles which surmount the buttresses and possibly at the lack of simplicity in the lower portions, but all such minor defects are more than balanced by the two magnificent towers which are not only finely proportioned but convey a certain subtle impression of the spirit of Latin America, which differentiates them from all others. The design of the belfries is most unusual, an octagonal chamber enclosed within a square pavilion-like structure, and is very successfully treated; on days of ceremonial, when a mammoth red, white and green national flag is hoisted on the flagstaff between the yellow masses of the two towers, its drooping folds lazily swaying in the wind against the clear blue sky above the busy square, the effect is as fine as anything I know



Domes, Lanterns and Towers

of anywhere. The interior is rather cold in color, with a glaring light from the high windows of plain glass, but there are several altars of blazing gold and the vista from one of the aisles through the alternating lights and shadows of the passage to the adjoining *Sagrario Metropolitano*, with its groups of black clad worshipers, is pictorial in the highest degree. As in most Mexican churches, the bells with their peculiar hanging are a prominent feature and in this case they are mechanically remarkable, for the largest is 16½ feet high, weighs 27,000 pounds, and was cast in the suburb of Tacubaya in 1792. Its "grave, sweet, and penetrating tones" (Terry) float above the roofs of the city to a long distance.



The Bells of San Angel

The church interiors are apt to be disappointing, for although they are generally carried out in honest and massive masonry, and are frequently well proportioned, the walls are so often covered with rather cheap and gaudy frescoes that much of their good effect is lost; they are redeemed to some extent by the color and heavy gold leaf of the carved wooden rococo *retablos* which succeed in conveying a certain imposing idea of barbaric splendor which is doubtless highly impressive to the simple peon worshipers. Many of the details of ornament in the Mexican churches can hardly be called masterpieces, but depend for their effectiveness chiefly upon excellence of scale, boldness of execution and what might be called their general suitability to the purposes for which they were made. That in design and execution they often fall far short of what would satisfy a discriminating architect today was proved not long ago when one of these Mexican *retablos* from a dismantled church was offered at auction in New York. Huge sections of roughly carved and rather gaudily colored wood exposed amid the dust and debris of an auction room lost much of the impressive splendor which they doubtless had in the original setting.



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City Hall and Cathedral, San Luis Potosi

Tower Hill School, Wilmington, Del.

BROWN & WHITESIDE, ARCHITECTS

IN the designing and planning of a private school an architect is not restricted or limited by many of the considerations which often affect the planning of a public school. The funds for the construction of a private school are usually provided by individuals or supplied by school associations, so that they do not come from the public revenue, and there is not often the resulting necessity for rigid economy which is sometimes so misapplied that much crippling and handicapping of otherwise free and intelligent solutions result. A private school is generally planned to accommodate no more than a given number of pupils and therefore the architect need not consider the necessity of turning to account, for the actual use of pupils, every available foot of area within the building, which is often necessary in the overcrowded condition of the public schools. Designing a private school, therefore, offers an opportunity much broader than is apt to be afforded in planning a public school of any kind.



Art Room over Master's Office

The Tower Hill School was designed to provide for 500 pupils and when it was opened about half that number were in attendance. It is a day school and therefore many of the problems met in the planning of residence or boarding schools were not considered. The building, with its furnishings and equipment, was the gift of several donors and it was their desire that the school be complete in every respect and that without the sacrifice of anything in the way of utility the building should possess distinct architectural merit and be such as would favorably impress the pupils at ages when ideas and standards of values are usually formed.

The buildings, which occupy a plot of considerable area, constitute a group of three structures—a central building of two stories and two one-story pavilions which are connected with the main structure by corridors or enclosed arcades. One of these pavilions contains the kindergarten while in the other is the assembly room or auditorium. The semi-isolation of these two buildings from the main structure makes possible their being operated independently and removes two possible sources of disturbance to the rest of the school life. Piano recitals, lectures or moving picture performances may be given in the auditorium without in any way causing interruption to the general routine.



East Arcade Looking toward Kindergarten

In the central or main building there are 9 class rooms, library, gymnasium, chemical and physical laboratories, study rooms for elementary and high school work, instructors' retiring rooms and first aid department, together with rooms for special courses such as model kitchens, domestic science laboratory, practice dining room, manual training room and refectory, and such utilities as laundry, kitchen, heating plant and refrigeration rooms. One part of the manual training room, which contains moving machinery, is shut off from the rest of the department and the refectory, where luncheon is served



Manual Training Room in Basement

daily on the self service or cafeteria plan, is managed by the domestic service department.

The wisdom of placing certain rooms of school buildings in basement portions which are necessarily at least partially below grade is a question upon which much might be written, but it may be observed here that the decision in such an instance should never be made without duly considering all the values at stake. Where such rooms would be badly lighted and insufficiently ventilated use of basement space would obviously be a mistake, but in this instance it has been found entirely practicable to place here such rooms as domestic science laboratory, manual training department, laundry and the kitchen, practice dining room and refectory with their various offices. The ground upon which these school buildings have been constructed falls abruptly in such a way that large windows and areaways of considerable width on one side of the buildings have made possible the use of such space in the basement.

The planning of the school has been done with the idea of securing the utmost in the way of convenience, both as to arrangement and equipment. The buildings are so grouped that the kindergarten, with three sides exposed, receives sunshine almost all day while the class rooms receive the sun throughout at least a large part of the school day; no shadows can be cast upon walls through which light enters the class rooms. Apparatus for heating and ventilating has been carefully planned and the type of windows used for the class rooms is such that they afford either the minimum or the maximum amount of outdoor opening. This type of window was found to be fairly expensive but it was thought advisable to install them as giving the widest flexibility in the way of lighting and ventilation and providing direct ventilation in seasons when the entire heating and ventilating systems would not be in use. Vacuum cleaners have proved to be advantageous and economical.

Due provision has been made for such details as electric illumination and electric power in the manual training rooms and mechanical plant. Program clocks, operated from the headmaster's office, are installed and a complete inter-communicating telephone system, operated from a switchboard at the information desk, brings the various departments into close touch.

In design the buildings follow what might be called the sentiment and feeling of the later English renaissance and they possess a high degree of scholastic merit and architectural consistency. The exterior walls are of brick laid up in Flemish bond and trimmed with limestone. The buildings, with the exceptions of doors, door trim, panel work in some rooms and wood floors in certain instances, are of non-combustible materials. Foundation walls below grade are of concrete, floors are of combination tile and reinforced concrete and the partitions are of tile.

The covering of floors throughout the building has been given particular attention. For certain rooms, such as auditorium, kindergarten, gymnasium, and in some other instances, wood floors seemed to be both necessary and desirable. Other rooms, and the corridors throughout, are floored with American quarry tile and sanitary bases of this material are placed around all the class rooms, where a linoleum tile floor is laid. This treatment, while fairly expensive, has been found to be practical for it is readily cleaned, practically noiseless and its color and design add to the attractiveness of the class rooms. Glass slides are used on furniture to prevent scarring the linoleum.



View in Kindergarten Wing



DETAIL OF MAIN FACADE

TOWER HILL SCHOOL, WILMINGTON, DELAWARE

BROWN & WHITESIDE, ARCHITECTS



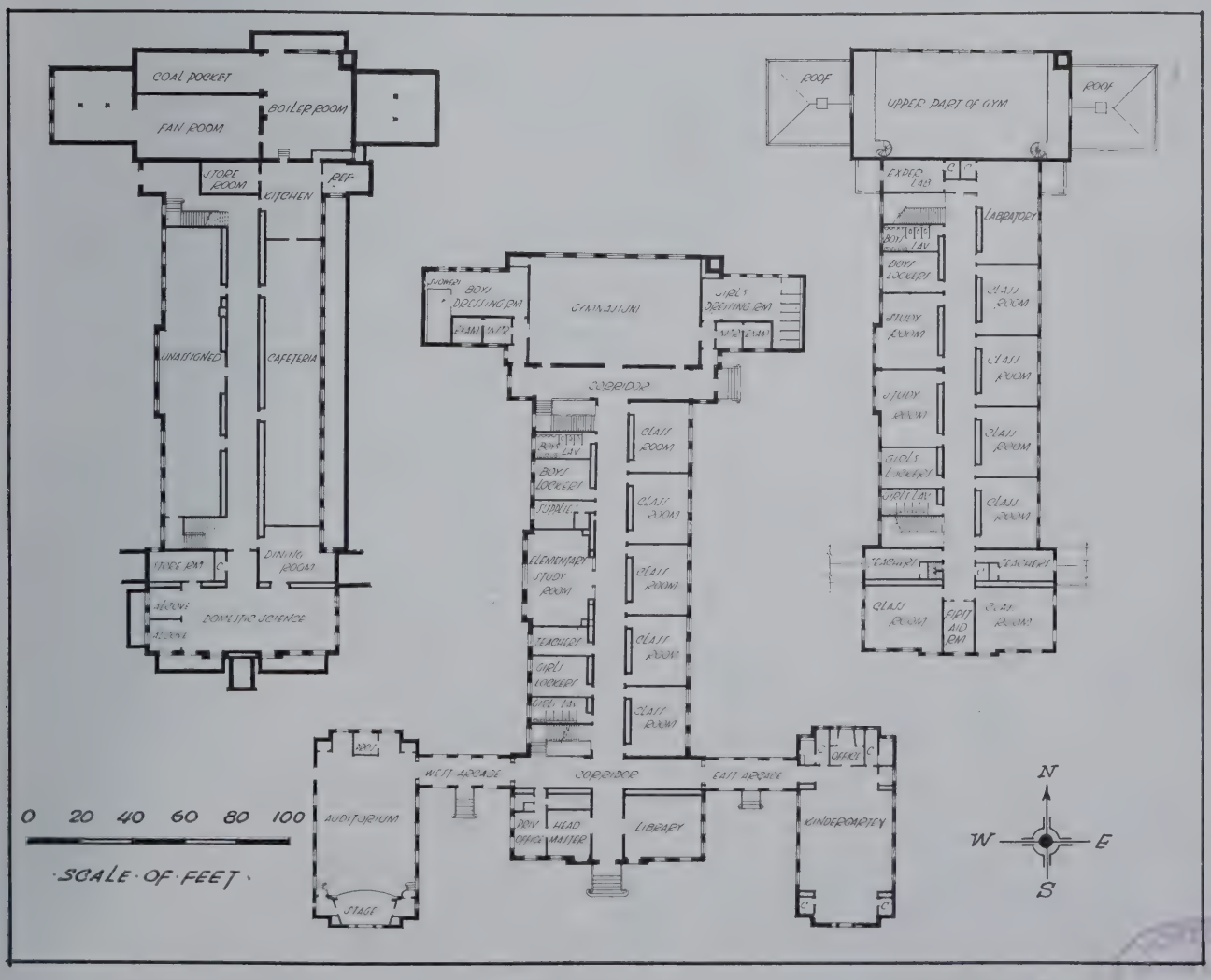
GENERAL VIEW

TOWER HILL SCHOOL, WILMINGTON, DELAWARE

BROWN & WHITESIDE, ARCHITECTS



SIDE OF CENTRAL BLOCK



BASEMENT PLAN FIRST FLOOR PLAN SECOND FLOOR PLAN

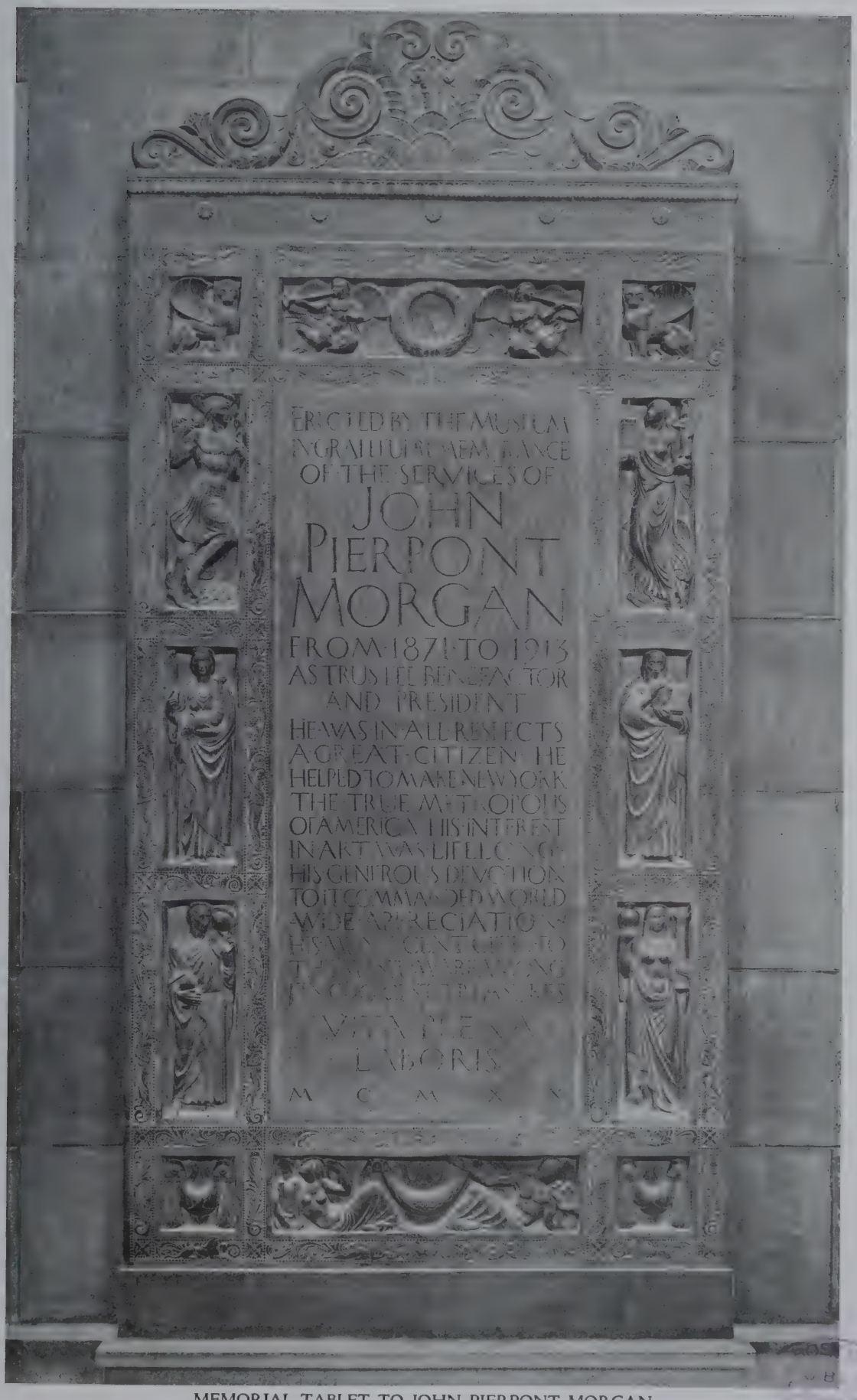
TOWER HILL SCHOOL, WILMINGTON, DELAWARE

BROWN & WHITESIDE, ARCHITECTS

DOORWAYS IN MASTER'S OFFICE AND LIBRARY

TOWER HILL SCHOOL, WILMINGTON, DELAWARE

BROWN & WHITESIDE, ARCHITECTS



MEMORIAL TABLET TO JOHN PIERPONT MORGAN

ERECTED BY TRUSTEES IN THE METROPOLITAN MUSEUM, NEW YORK, N. Y

PAUL MANSHIP, SCULPTOR



Early American Domestic Architecture

V. THE SIR WILLIAM JOHNSON HOUSE, FORT JOHNSON, N. Y.

MEASURED DRAWINGS BY WM. D. FOSTER AND LEWIS E. WELSH

WEST of Amsterdam, New York, on the Mohawk turnpike and at the edge of the Mohawk River, stands the house built by Sir William Johnson in 1742.

This fine old dwelling of gray stone is very impressive amid its surrounding trees. The entrance porch which is very fine in proportion and detail makes a center of interest as one views the simple façade. The roof which is now of slate was originally of lead but this was removed during the revolution to be made into bullets. The rather unusual and very English dormers are original. The muntins and sash are noticeably wide but are in excellent keeping with the stone walls.

The decorative interest of the exterior is centered at the main doorway with its portico. Classic columns support an open pediment the ornamented frieze of which is continued within the portico and across the top of the doorway itself. There is no transom and the door, like the windows of the house, is fitted with heavy paneled wooden shutters.

The rear of the building is extremely satisfying with its stone wall broken by only four openings.

The plan is simple: a central hall is flanked by the living room and what may have been an "office" on one side and by the dining room and kitchen on the other. Upstairs are the usual four rooms while the attic remains unfinished and open to the ridge, there being no extra floor as the higher dormer would seem to suggest.

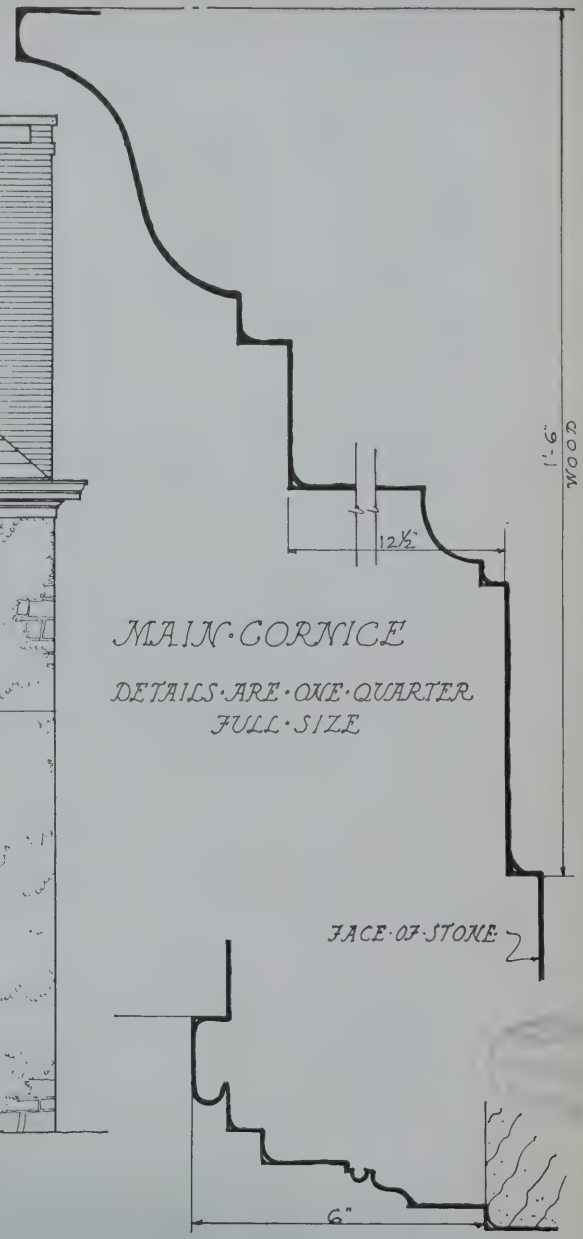
The living room is particularly dignified with its fine mantel and four paneled walls. The trim around the doors in this room and in the hall is worthy of notice with the unusual added mould outside the regular trim. The dining room is less formal; the walls are papered and the only feature in the room is the well proportioned mantel.

The house is in unusually good repair, without having been "restored." It was purchased by the late General De Peyster of New York and presented to the Montgomery County Historical Society. This Society has re-furnished the place as nearly as possible in the fashion of the days when it was occupied by Sir William Johnson and described in correspondence which he had with his architect and decorator. From this correspondence it is learned that the paneling was made in England and the window sash and glass in France.



FRONT · ELEVATION

SCALE · 1/8 EQUALS · 1'-0"



MAIN · CORNICE

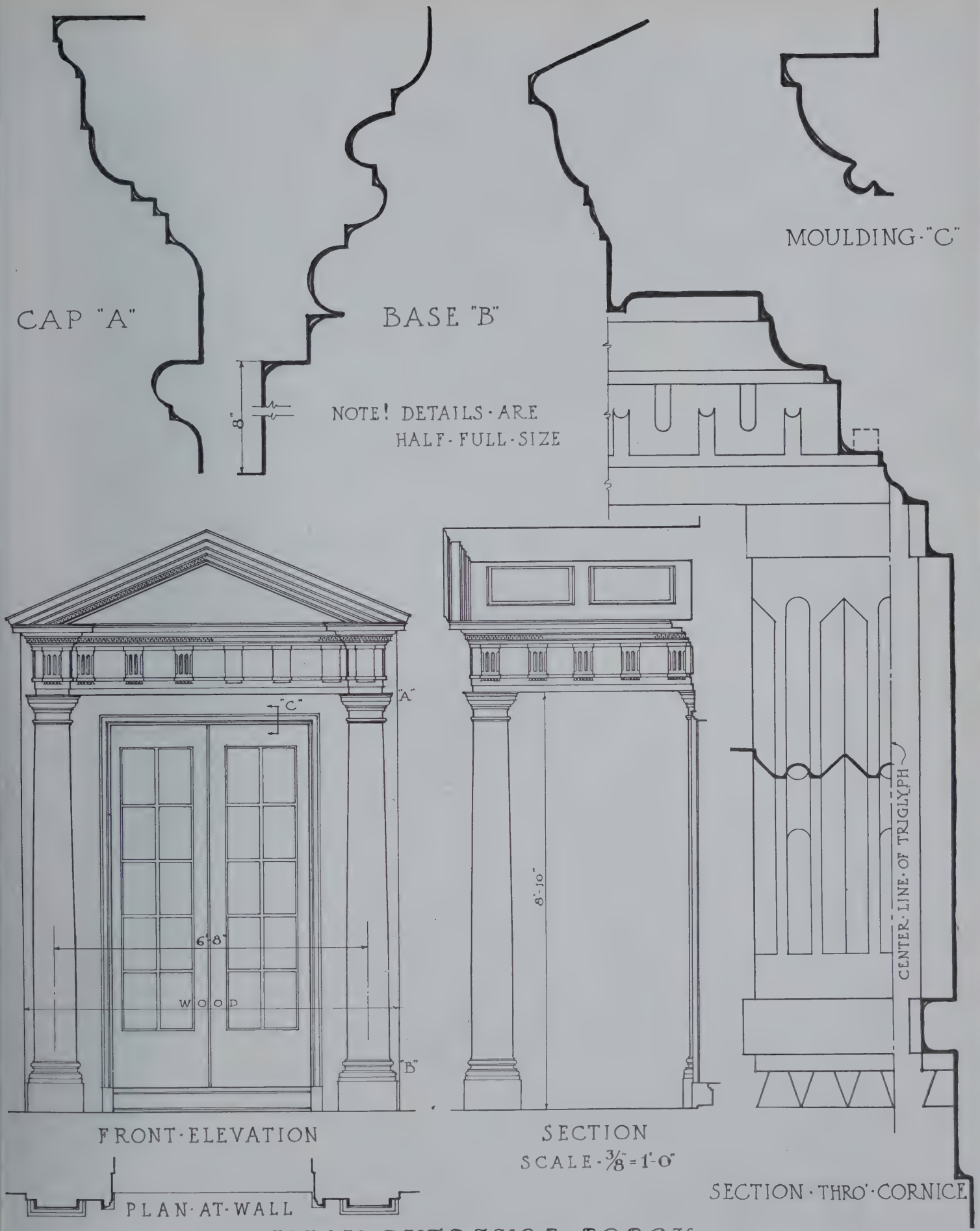
DETAILS · ARE · ONE · QUARTER FULL · SIZE

WINDOW JAMB EXTERIOR

EARLY · AMERICAN · DOMESTIC · ARCHITECTURE · · · 1920 ·

SIR · WILLIAM · JOHNSON · HOUSE
FORT · JOHNSON · N · Y ·

MEASURED AND DRAWN BY · WM · D · FOSTER · · · AND · LEWIS · E · WELSH ·

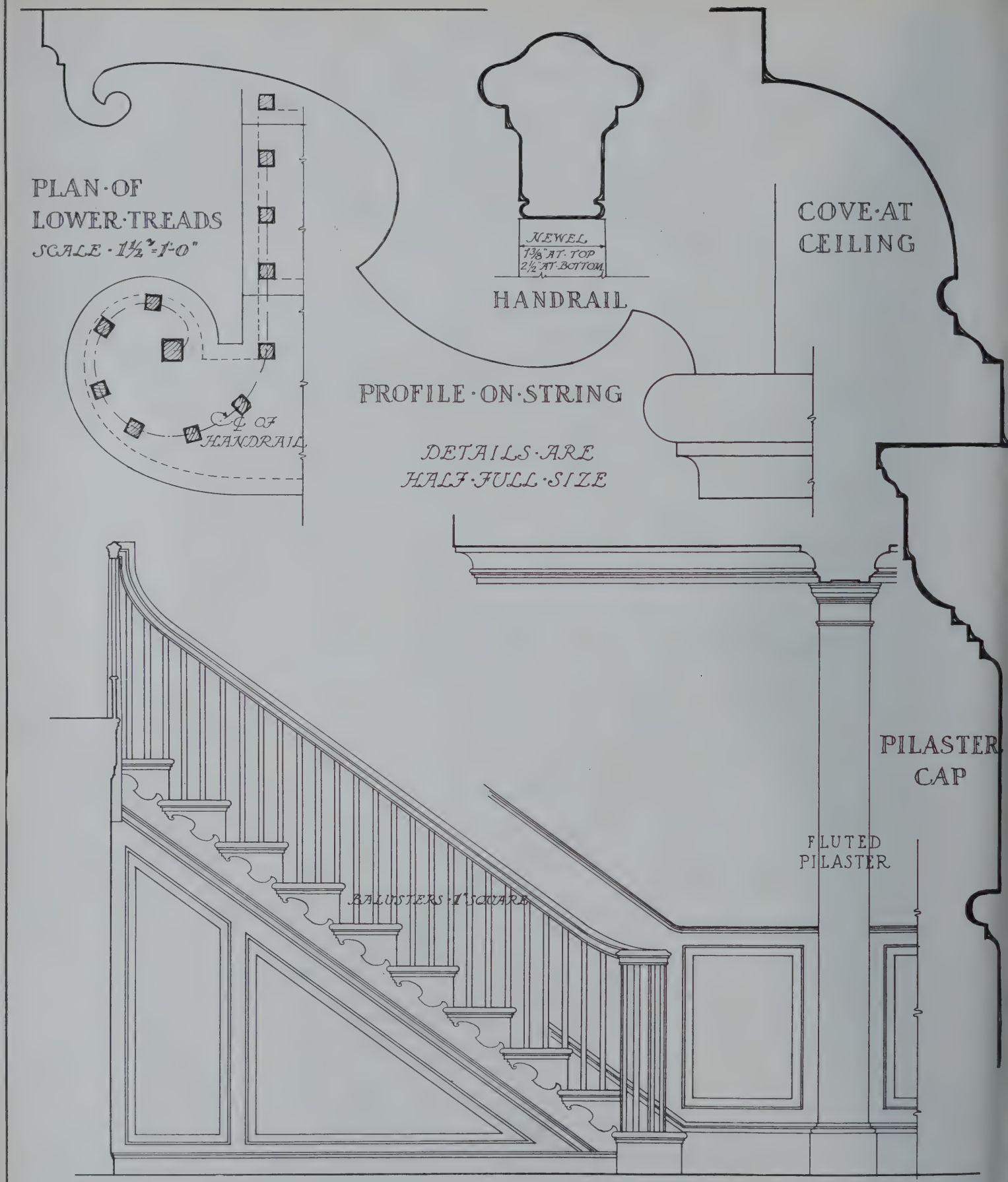


MAIN ENTRANCE PORCH

EARLY AMERICAN DOMESTIC ARCHITECTURE ... 1920

SIR WILLIAM JOHNSON HOUSE
FORT JOHNSON N.Y.

MEASURED AND DRAWN BY WM. D. FOSTER ... AND LEWIS E. WELSH



MAIN·STAIRCASE

SCALE·½"=1'-0"

EARLY·AMERICAN
DOMESTIC·ARCHI-
TECTURE ··· 1920

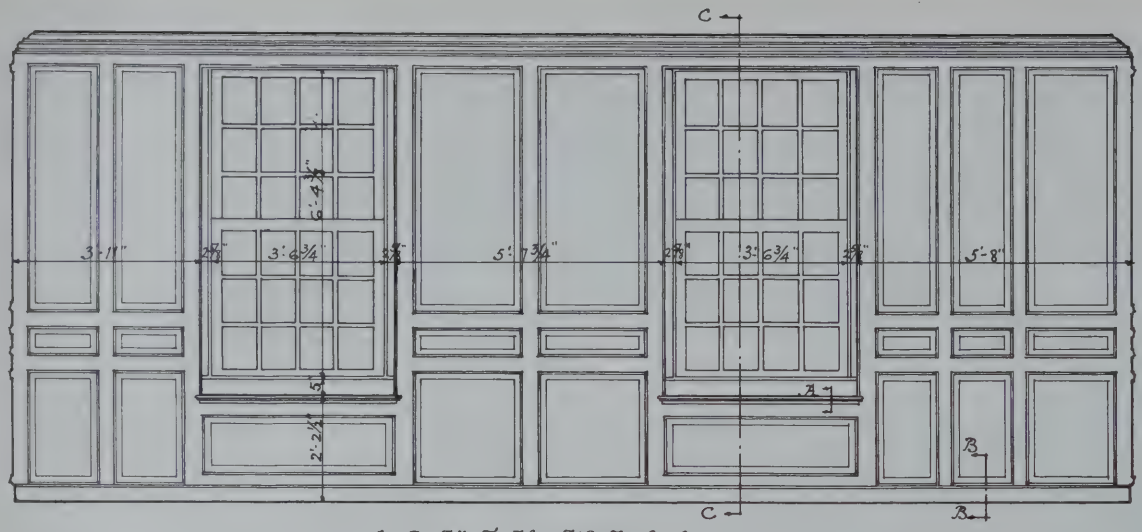
SIR·WILLIAM·JOHNSON·HOUSE
FORT·JOHNSON·N·Y·

MEASURED·AND·DRAWN
BY·WM·D·FOSTER
AND·LEWIS·E·WELSH

ENTRANCE DOOR

MAIN STAIRWAY

THE SIR WILLIAM JOHNSON HOUSE, FORT JOHNSON, N. Y.

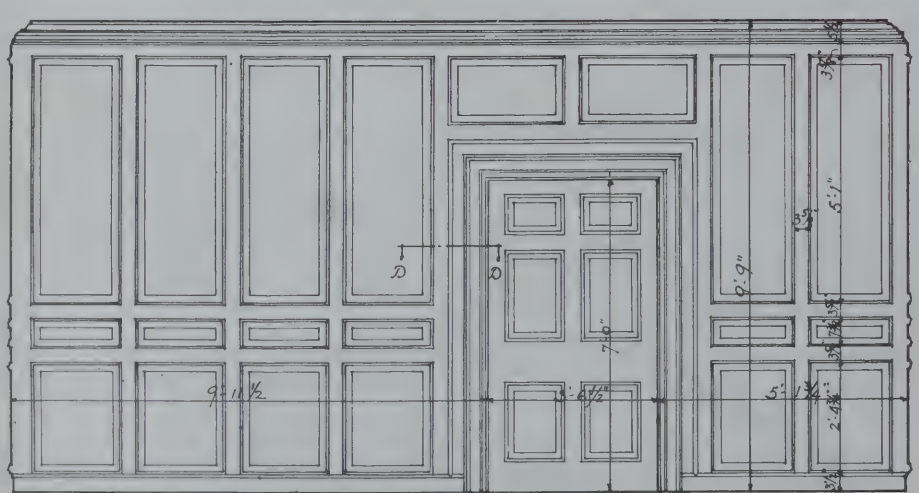


SOUTH·WALL

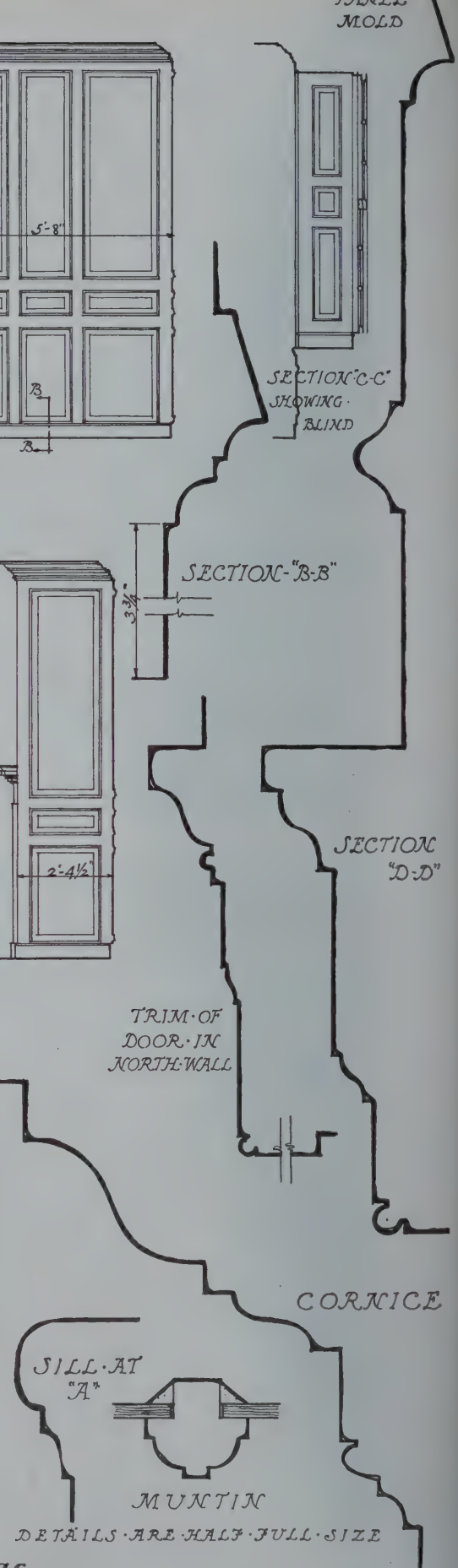


WEST·WALL

SCALE·OF·ELEVATIONS·IS·¼"-1'-0"



EAST·WALL



DETAILS·ARE·HALF·FULL·SIZE

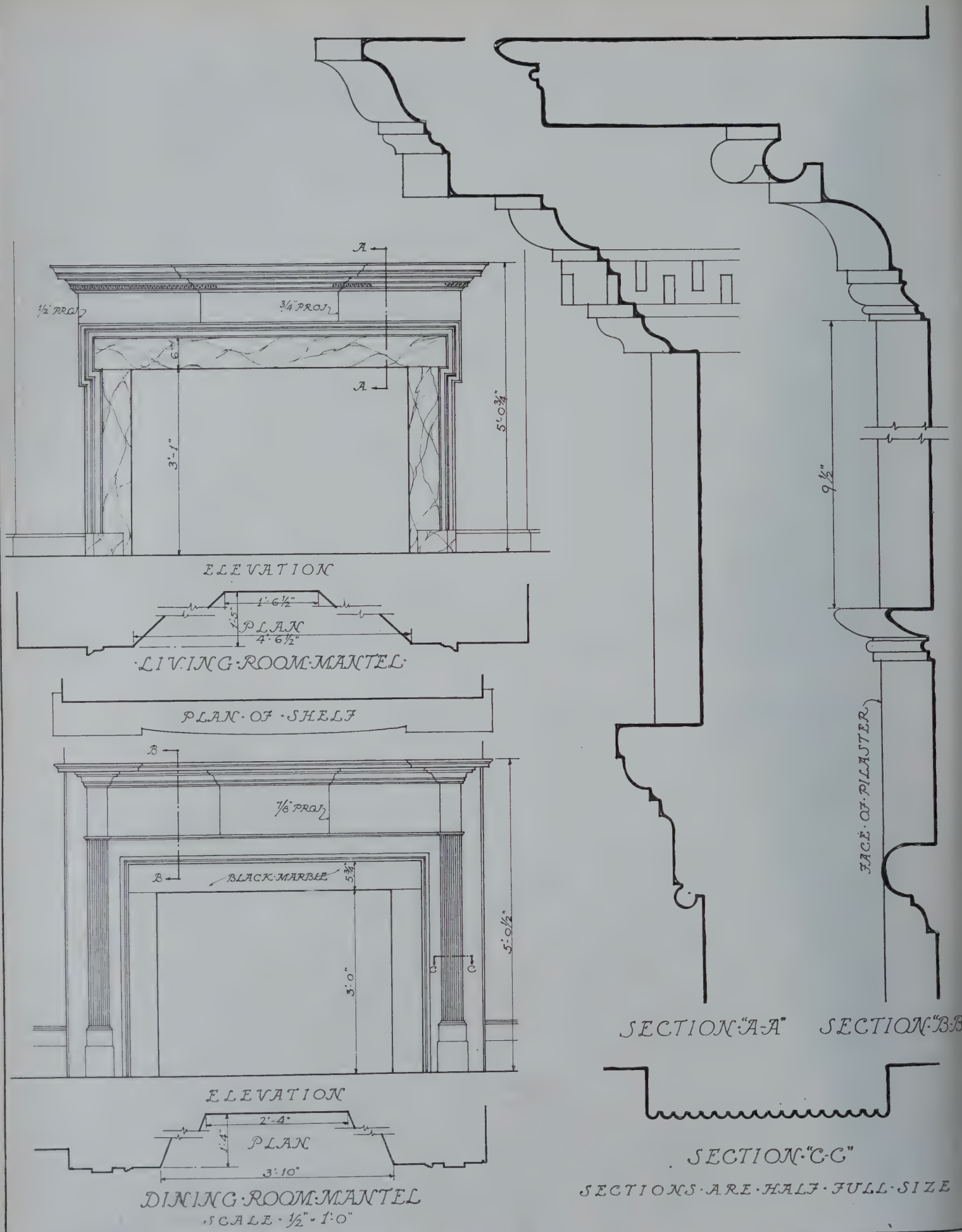
LIVING·ROOM

EARLY·AMERICAN·DOMESTIC·ARCHITECTURE · · · 1920·	SIR·WILLIAM·JOHNSON·HOUSE FORT·JOHNSON·N·Y·	MEASURED·and·DRAWN By·WM·D·FOSTER··· And·LEWIS·E·WELSH·

LIVING ROOM MANTEL

DINING ROOM MANTEL

THE SIR WILLIAM JOHNSON HOUSE, FORT JOHNSON, N. Y.



EARLY AMERICAN DOMESTIC ARCHITECTURE ... 1920

SIR WILLIAM JOHNSON HOUSE
FORT JOHNSON N.Y.

MEASURED and DRAWN By WM. D. FOSTER ... And LEWIS E. WELSH

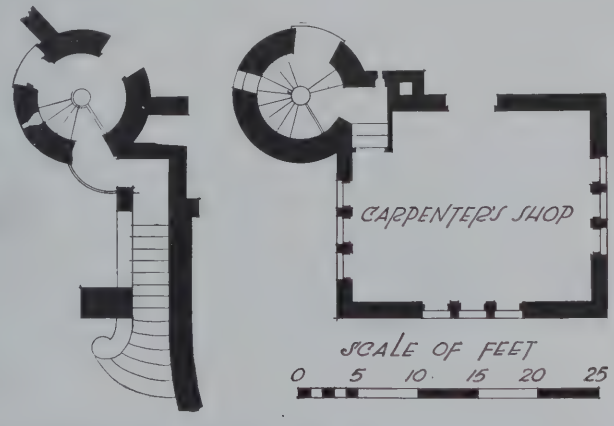
Farm Buildings of Arthur Curtiss James, Esq. Newport, R. I.

By W. F. ANDERSON
GROSVENOR ATTERBURY AND STOWE PHELPS, ASSOCIATED ARCHITECTS

TO those familiar with the Rhode Island coast line in the vicinity of Newport but small introduction is needed concerning the natural beauties, which the architect finds as a setting for his proposed buildings. For the benefit of those unacquainted with this stretch of coast, it may not be amiss to say that generally it is a rocky shore with small beaches, and bays formed between projecting points. Such in general are the conditions at this estate, and such a hollow facing toward the water was chosen as the site for the farm group. The land contours favored placing the buildings in a curved line, not entirely regular but sufficiently so to give, from a bird's-eye view, a rough horse-shoe shape.

The visitor's first impression is that he has entered a village of Northern Italy. There are the same stone walls laid with wide flush joints in light mortar, the old moss colored tile, the irregular roof lines of higher buildings and the home-like cottages against the hillside. The eye follows the curving road around the little valley between the hills, and as the visitor actually travels the road, he crosses, on the top of the bridge, over the road by which he entered, and thence by a higher level on and up the hills to other parts of the estate.

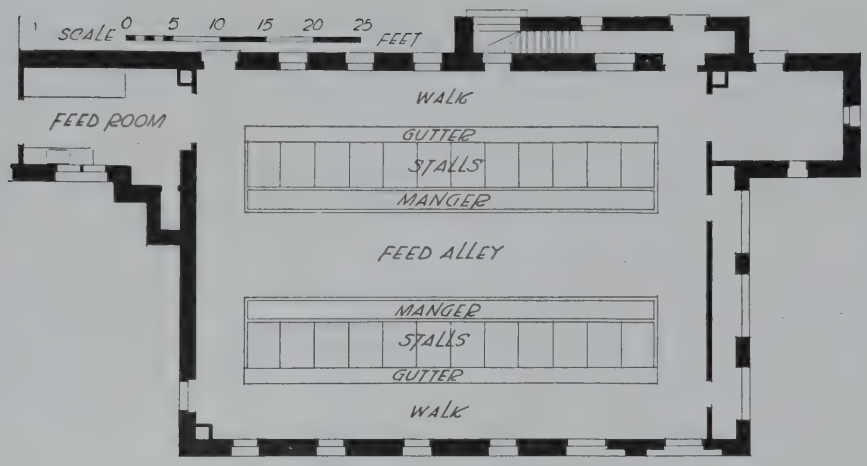
As might be expected the ground provided all the stone needed for the masonry work, and a fair sized quarry was developed in the process of excavation. The stone is of granite formation, and where exposed to view is laid in random ashlar with the joints slushed full. In many places the mortar has been spread out and resembles a stucco surface. The stones framing all openings were cut to a line but not dressed. The voussoirs of arches were roughly formed to shape, no two of the same size. The general wall thickness is 20 inches.



Roofing tile used are unusual and follow an old hand made tile in design and finish; they are of mission shape, hand combed and sprayed with



Carpenter Shop from Plaza of Cow Barn



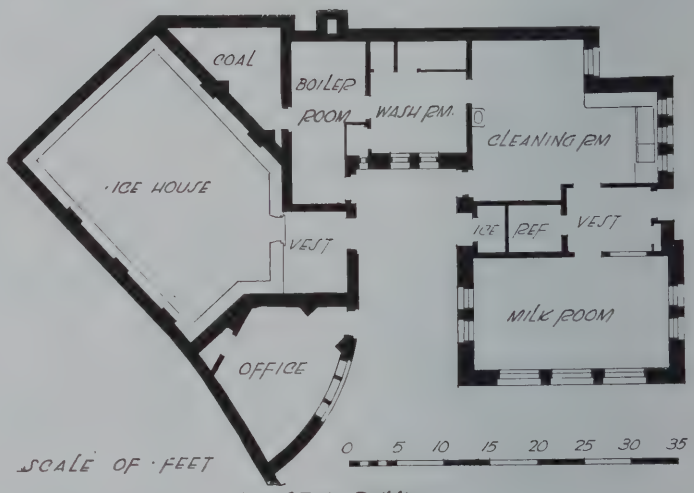
Plan of Cow Barn

beneath the cow barn which stands at one end of the bridge over the main drive.

The carpenter shop stands on high ground at the opposite end of the bridge. Here, beneath the roadway, were constructed storage sheds and coal pockets. The exposed walls of these structures are of stone, matching all other stonework and blended into the ensemble in a very pleasing manner. In the buildings where the stock are quartered, the walls are damp-proofed on metal lath.

pigments before firing and the color effect is that of a surface covered with moss and lichens. Comparatively little woodwork is exposed to view and this is partly painted and partly stained.

The farm group proper is composed of a cow barn, accommodating 24 cows, and an L shaped extension in which are located the feed and hay storage spaces besides a maternity building, bull pens, dairy and ice houses, two cottages accommodating one family each, carpenter shop and work building, garage and storage sheds. The natural ground level permitted construction of a stable with six horse stalls and a wagon shed



Plan of Dairy Building



Entrance to Bull Pens in Maternity Building (G)

In the cow barn the floors of the stalls are laid in cork brick and other floors are of cement.

In the dairy one finds white ceramic tile floors throughout, with white glazed tile walls from floor to ceiling in vestibule, milk room and cleaning room, and tile wainscots in wash room and toilet. Everything in connection with the dairy is arranged to promote cleanliness and purity of the milk products. The receiving tank is located in the vestibule and discharges through a pipe into the cooler located in the milk room. Here are installed a cooling apparatus operated by electric pump and water circulating system, a separator,



Cow Barn (Left) and Maternity Building (Right) with Bull Pens in Lower Story (H)

bottle filler, churn and other devices of like character. So far as possible all machinery is driven by electric motors.

A complete high pressure steam boiler is provided to supply live steam at the various points needed. The washing room contains the steam bottle washers and sterilizers, and just beyond are shower baths for the men, a washing machine to wash white working clothes and a hot room for drying them.

One very interesting feature of the dairy is the refrigerator. This has the ice chamber at the back, so that it can be easily filled, and the front portion is of tile and fitted with glass shelves. It is lighted by electricity and, particularly when illuminated, makes an attractive exhibit. The ice house is built directly against the cliff wall and the roof is covered with earth in which trees and shrubbery are growing. It is connected directly with the dairy building, for ease of access, and is constructed of masonry matching the other buildings. The walls are insulated with mill shavings behind sheathing boards.

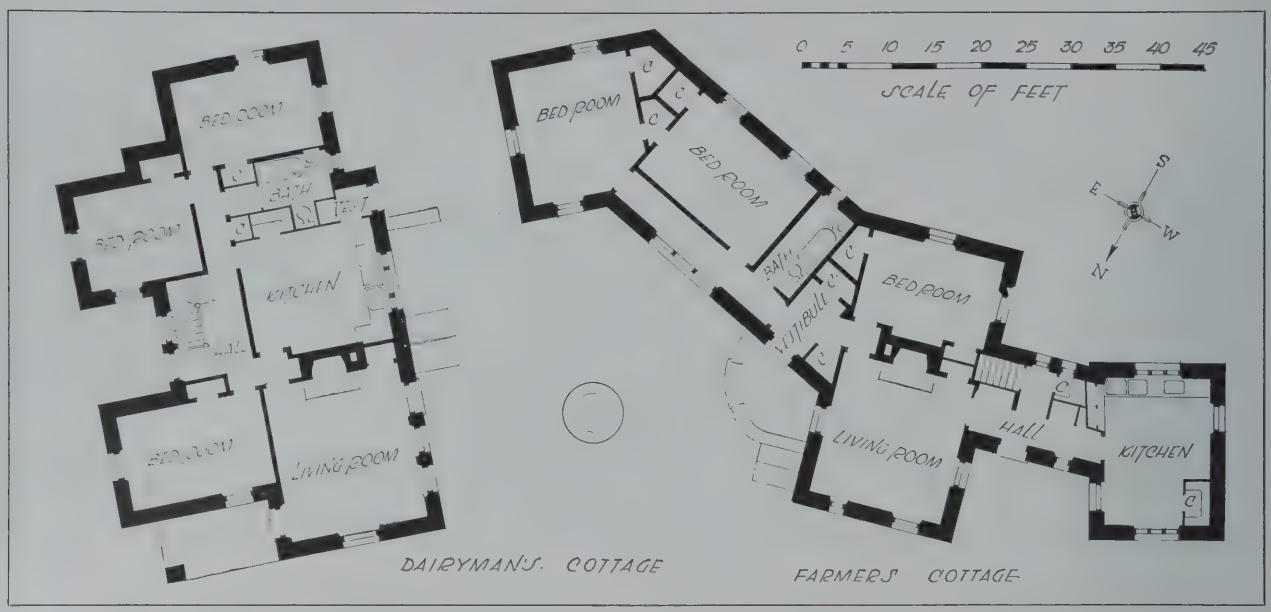
The carpenter shop and the farm office buildings presented opportunities for architectural effect.



Block Plan (Arrows and Letters Show Angles at which Views are Taken)



Upper Part of Carpenter Shop (K)



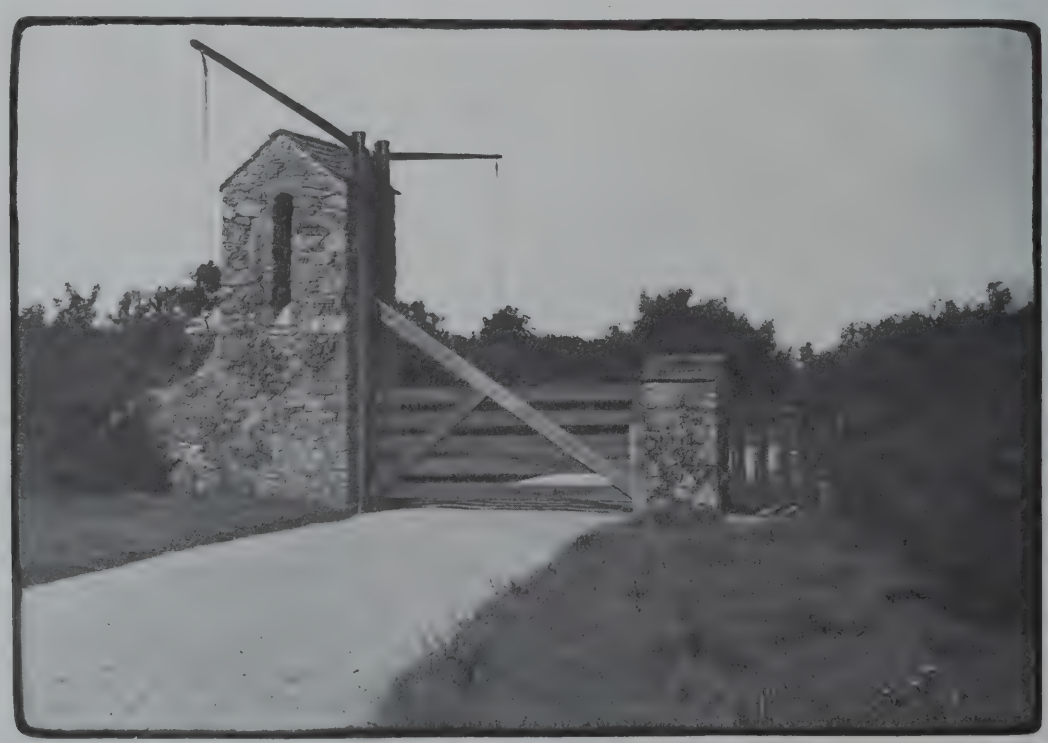
Plan of Cottage Group

The shop is built with stone walls pointed up and left exposed on the inside. The outside stone stairs and the weather vane supply attractive bits of detail. As far as possible all lumber used was obtained from old buildings with natural weathered surfaces. Rafters, beams and floor boards are laid to show the weathered surfaces. The doors are of pecky cypress; new stock was stained and antiqued.

The farm office follows the same general scheme but has the inside of the walls finished in rough Portland cement. The fact that this building is erected against the side of the cliff which forms one wall determined this finish.

The cottages in their inside arrangements for living accommodations conform to the plan of the best buildings of their class. The interiors of these cottages and of the farm office are as thoroughly Italian in color scheme and detail as the exteriors. By means of the large fireplaces, heavy beamed ceilings, and bright colors used in the decorations, the old world atmosphere is faithfully preserved.

The piggery with its adjoining yards must not be overlooked, nor the smoke house. Here in rooms devoted to killing, dressing and smoking, the young porker is converted into his ultimate form of ham and bacon in the most approved manner.



South Entrance Gate (L)



STAIRS IN CARPENTER SHOP FROM LOWER TO UPPER LEVEL (A)

"SURPRISE VALLEY FARM" FOR ARTHUR CURTISS JAMES, ESQ., NEWPORT, R. I.

GROSVENOR ATTERBURY AND STOWE PHELPS, ASSOCIATED ARCHITECTS



CORNER OF FARMER'S COTTAGE (B)



COURT BETWEEN DAIRYMAN'S AND FARMER'S COTTAGES (C)

'SURPRISE VALLEY FARM" FOR ARTHUR CURTISS JAMES, ESQ., NEWPORT, R. I.

GROSVENOR ATTERBURY AND STOWE PHELPS, ASSOCIATED ARCHITECTS



CORNER OF DAIRYMAN'S COTTAGE (D)



COW BARN WITH STEPS FROM LOWER TO UPPER LEVEL (E)

"SURPRISE VALLEY FARM" FOR ARTHUR CURTISS JAMES, ESQ., NEWPORT, R. I.

GROSVENOR ATTERBURY AND STOWE PHELPS, ASSOCIATED ARCHITECTS



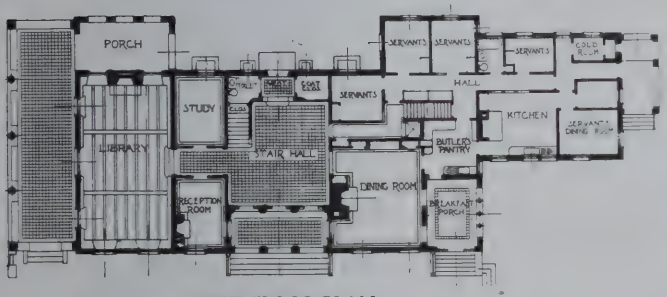
GENERAL VIEW

HOUSE OF REV. WILLIAM M. CRANE, RICHMOND, MASS.

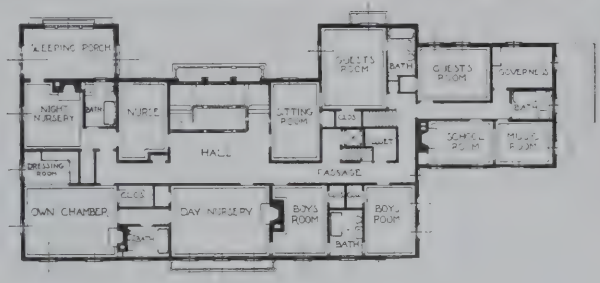
KILHAM & HOPKINS, ARCHITECTS



VIEW FROM APPROACH



FIRST FLOOR PLAN



SECOND FLOOR PLAN



DETAIL OF TERRACE FRONT

HOUSE OF REV. WILLIAM M. CRANE, RICHMOND, MASS.

KILHAM & HOPKINS, ARCHITECTS

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Terra Cotta Roofing Tile

PART I

By ALFRED LO CASCIO

THE subject of terra cotta roofing tile has been discussed from time to time from almost every angle but, notwithstanding this, the fact remains that in some sections of the country roofing tile is but seldom used. There is no question but that vitrified shale tiles are highly artistic in color and form, and are practical for use with almost any type of building. Many opportunities have presented themselves to owners, architects and builders for making very artistic structures out of work in hand, where the finishing touches could have been given by the use of tile, but for some reason or other these opportunities have often been neglected.

The question naturally arises whether the owner, architect, builder or manufacturer is at fault. In this age of progress and selection of materials from the standpoint of durability instead of that of first cost, it would seem as though the use of terra cotta tiles at present should far exceed their use in the past. It may be that many architects fully intend to use roofing tile in their projects but that stress is laid so frequently on economy that some other form of roofing is adopted; this economical turn gains the day from the standpoint of first cost, although in the course of a few years the maintenance cost of the other material may far exceed the increased initial expenditure if tile had been used.

If the manufacturer is at fault, it may be that he has not sufficiently advertised, or his salesmen have not sufficiently emphasized, the essential durability and practicability of roofing tile, and also the ultimate economy which will inevitably result from its use. If the architect is at fault it may possibly be because he has not taken time to investigate the great merits and the adaptability of the various kinds of roofing tile, and the attractive and pleasing variations in textures and artistic color schemes which may be worked out with these products—color schemes which will last indefinitely and be mellowed with the passing of time.

The owner may be a trifle at fault, perhaps, due to false impressions of price and first cost, and also because the material is not often presented in the light of its true and lasting values. Undoubtedly it would be beneficial to many of our fine buildings and residences, if all of the people interested in the production and



House at Brookline, Mass., with Red French Tile Roof
Newhall & Blevins, Architects



House at Philadelphia, Pa., with Red Shingle Tile Roof
E. Allen Wilson, Architect

the use of tile roofing would investigate a little more fully the field of its possibilities and would co-operate with each other. This would effect a decided change in the attitude of the general public towards this material which, undoubtedly, in the course of time, will be more generally used because of its merit, and in spite of the present lack of tendency to more general use.

In this product, as with most manufactured mate-

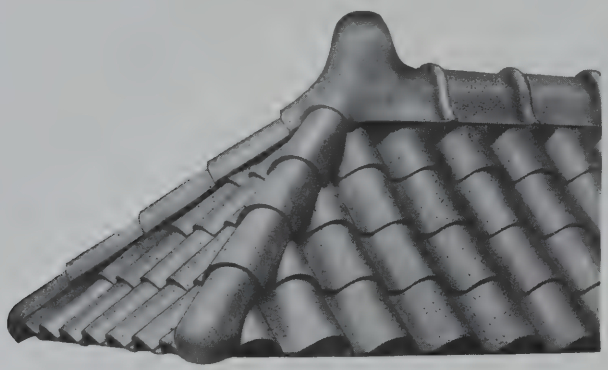


Fig. 1. Spanish or Old Mission Roof Tile

rials, the cost of the pattern is a considerable factor. Few factories are equipped with machinery for special pattern work, and the manufacturers frequently place all sorts of obstacles in the way of using special forms, shapes and sizes, and urge, instead, the acceptance of stock products. The time has come, however, when some manufacturers are paying special attention to individual treatment and design, special colors, special surfacing and other details which make for individuality. They are also glad to work to the best of their

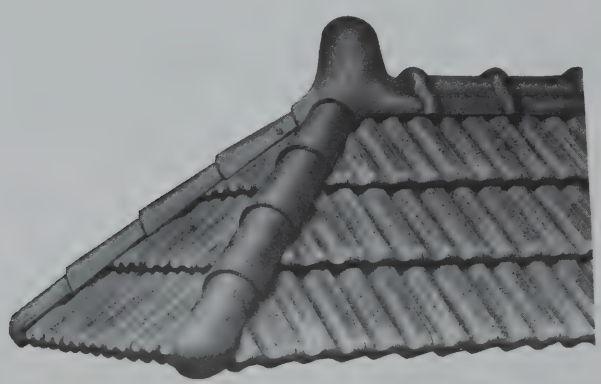


Fig. 2. French Type Tile, Hip and Ridge

ability with architects, experimenting without end to get the desired effects, providing there is a sufficient interest to stimulate their endeavors.

Architects should realize that factory conditions are frequently such that the manufacturer may not be able to produce special tile in the time allowed, no matter how keen his willingness and desire to do so may be. The cost of such a product does not deter the manufacturer, provided his time allowance or other factors permit his producing the special work. It is obvious that when special work is ordered the architect or owner must be prepared to find slight variations in the completed product. A knowledge of kiln work, firing and other process details would immediately demonstrate the impracticability of expecting each tile to exactly duplicate in color and marking the sample submitted. The variations are slight, however, and are due only to the manufacturer's earnest endeavor to produce perfect results. Just such efforts as these bring forth the moss covered tile, the hand roughened surfaces and various antique sprays, all of which contribute to the general aged appearance so that many roofs in which these materials have been used have the appearance of being far older than



Fig. 3. Closed Shingle Tile with Hip and Ridge

they actually are, often adding largely to the appearance of the finished buildings. Color schemes and textures may be used in certain constructions so that tiles wonderfully resemble those toned by nature's processes, and will produce such effects as are so often seen in foreign countries—roofs aged, with the hard lines lost, even to the valleys being rounded, the surfaces swinging gracefully from roof to roof with mitered hips.

There are three general forms of roofing tile now in common use: the Spanish or old mission, (Fig. 1) French, (Fig. 2) and closed shingle, (Fig. 3). Each type illustrated here has an appropriate setting and

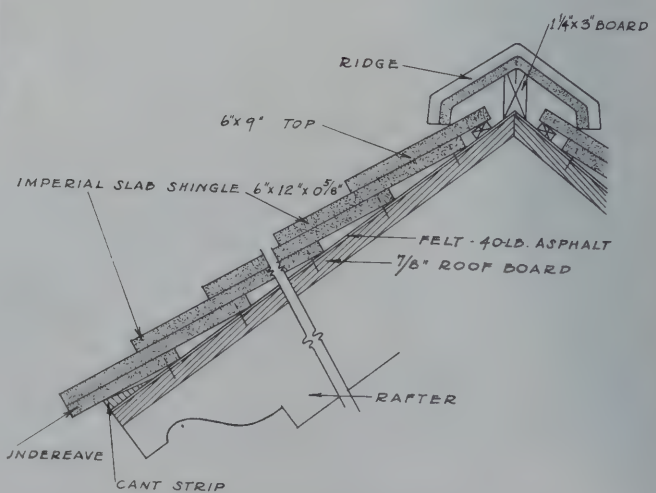


Fig. 4. Section Showing 6-inch Slab Shingle Tile

each type has its particular use. The Spanish tile would be obviously out of place in the small cottage, but in the monumental building it adds far more to the general appearance than would the closed shingle tile. It also adds "scale" to the structure and this feature must always be considered. A large, unbroken expanse of roof requires some texture, character or lines to add interest to the surface. In a small, broken up roof, on the contrary, the Spanish or French tile would only create an appearance of restlessness, due to the small surfaces.

In connection with the installation of each kind of tile there are differences in the preparatory carpenter work which must not be overlooked when planning for their use. The principal difficulty in the use of tile for roofs probably lies in the fact that until recent years the architect and contractor were not familiar with the necessary construction and details of their use, which differ materially from the details adapted for use in any other form of roofing.

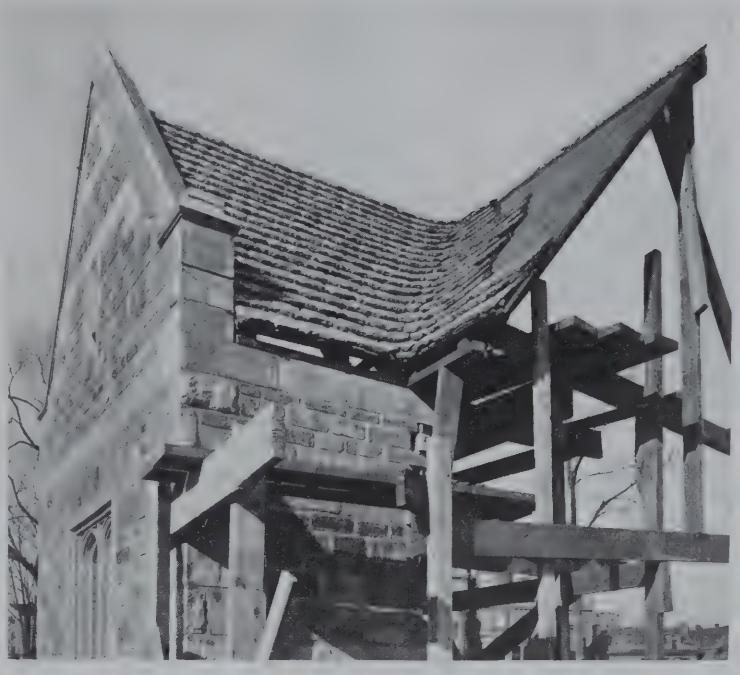


Fig. 5. Yale College Memorial Quadrangle, New Haven, Conn.
James Gamble Rogers, Architect

It is very simple to arrange the construction as may be necessary to take care of the different points, but in order to make clear the preparatory work which should be done, before the tiles themselves are used, it would be well to study carefully some details regarding their use.

Fig. 4 shows the construction used in both eaves and ridge where shingle tile is used. This tile usually comes about 6 inches wide, 12 inches long and $\frac{3}{8}$ to $\frac{5}{8}$ inch thick. In connection with this shingle tile it is necessary to provide at the eaves of the roof a cant strip of wood approximately $1\frac{1}{4}$ inches high, beveled to nothing on the roof. Over this the roofing felt is placed, then a hip and ridge board approximately $1\frac{1}{4}$ inches thick and 3 inches high is used at all hips and ridges to receive the hip and ridge tile. It makes a far better construction to place the hip and ridge boards over the felt after the roof has been papered in, and these boards should be placed when the tile man arrives on the job to begin his work, and under his direction. Besides using elastic cement for both constructions, the hip and ridge tile are nailed in place to the hip and ridge boards.

Fig. 5 is a photograph illustrating the use of this shingle tile, with the eaves and preparation for ridge board clearly indicated.

Figs. 6 and 7 show the type of construction with the flat deck roof joining the tile sloping roof over the tile. This construction is very simple and practical, and yet it is perhaps not so well known as some of the other methods of roofing. After placing a 2 x 6 board all around the top of the deck, 3 x 4 openings about 10 feet apart are made, forming cutouts, which are thoroughly flashed, and over this the ridge tile is placed, giving a finished appear-

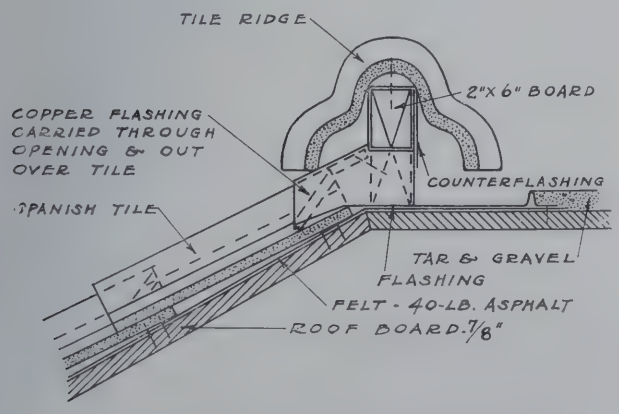


Fig. 6. Method of Flashing at Deck to Carry Water over Tile

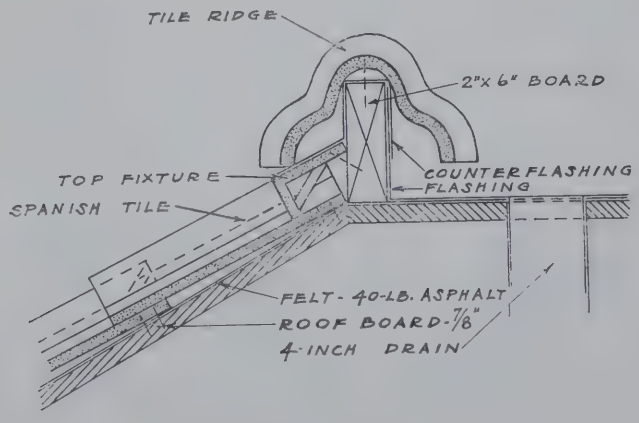


Fig. 7. Method of Flashing at Deck When Inside Drain Pipe Is Used



Roof of Spanish or Old Mission Tile Showing Usual Practice in Sloping from Vertical Walls

ance and indicating the flat roof in back of the original board. This construction can also be applied even though the water is taken down through the building somewhere on the flat roof; the same counter and under flashing in connection with the 2 x 6 board will give a perfect construction. If flat tile is used, in place of the Spanish roll tile, and if the ridge is angular instead of round, the same construction applies with the exception that the height of the ridge board is changed, and a 2 x 3 instead of 2 x 6 is used, depending, of course, upon the pitch of the roof and the kind of tile used.

Fig. 8 shows a method of flashing a valley with copper or other metal. In this case, the copper used is 20-inch stock, 10 inches turned up on each side and turned up 1 inch along the edge the full length of the valley, and cleated with a small strip of copper to the board roof in a manner to prevent nailing through the copper valley itself. Care should be taken that the roofing paper is placed over the metal valley. This, of course, is a construction

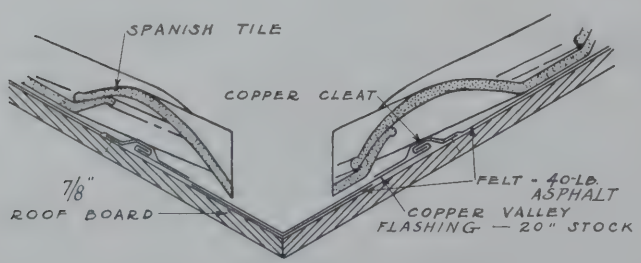


Fig. 8. Section Showing Valley Flashing

where only a few inches of the copper on each side of the valley are exposed. If a rounded valley, such as is used with heavy shingle tile, is desired the flashing must be over and under every course of tile. Valley tiles, meaning the finish on each side of the valley itself, are specially made to fit the pitch of the roof, which is far better than attempting to cut the valley tile. This would leave openings in every course, while the specially made tile is closed throughout the length of the valley.

In connection with the different types of tile installations, it is well to call to mind again one of the uses of roofing tile which has frequently been neglected; that is, for parapet covers. Fig. 9 shows two methods of using the stock tile for this purpose. There is also a special terra cotta tile made for the express purpose of covering parapet walls. Wherever these walls are covered, especially in the cases of low parapets, copper should be carried up on the inside of the wall and flashed in under the tile.

The methods of application and conditions under which tile are used in the old world countries are well recognized to have very little in common with the roofing problems encountered in central North America. It is common knowledge that many were the dismal failures where English or Mediterranean methods were followed for the exclusion of the elements when American roofing tile was in its infancy or when importations themselves were employed.

With unsatisfactory tile roofs in many architects' minds a decade ago, the manufacturers have built

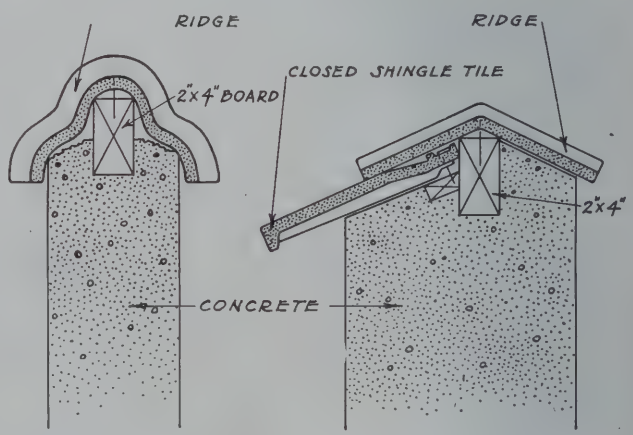


Fig. 9. Example of Tiling for Parapet Walls

up a tile suitable to our requirements. Styles which were considered "unique" at the time were abandoned and forms which fulfill the ideals of students of European work of merit are incorporated with the substantial clay body now used—a truly uphill task and a commendable piece of progress.

With the plastic materials at hand it is desirable that the effects produced should not deviate from those conceived within the limits of the ceramic arts.

Truss Design and Details

PART IV. WOODEN ROOF TRUSSES

By CHARLES L. SHEDD, C.E.

IT IS common in wooden buildings to have an inclined roof and when such is the case and the span is great enough to require a truss, one of such shape as shown in Fig. 14 is frequently used.

In this diagram the wooden members are shown by heavy lines and the steel or wrought iron rods by light lines. All of the wooden members resist compression except the bottom chord. Some designers have constructed this too of steel, espe-

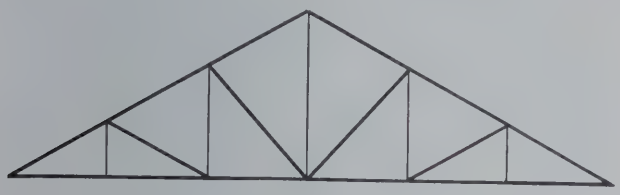


Fig. 14

cially in heavy trusses where the framing of notches in this stick together with the area required for direct stress necessitated an unusually large stick of timber. All of the rods resist tension except the short vertical rods near the end which do not resist any stress unless there is a load on the bottom chord such as a ceiling or a hung balcony. When there is no stress in this rod it may be omitted unless the span of the lower chord from the support to the first panel point is so great that the member would sag too much under its own weight.

A detail of one of the interior joints is shown in Fig. 15. Here is also shown the manner of constructing the roof purlin and timbers to rest on the truss.

The boards run at right angles to the truss and are nailed to rafters running parallel to the truss and on the incline. These rafters are fastened to purlins under them which, in turn, run at right angles to the truss. The rafters are notched slightly over the purlin, say about one inch, to prevent slipping and to aid in accuracy of framing. These purlins act as beams. Their principal loads are from the dead load of the roof and from snow. These of course, due to gravity, are vertical. In addition to these loads they resist a horizontal force due to the wind. In case the wind is considered as acting normal to the roof it may be resolved into its two horizontal and vertical components. In any case the horizontal component is small compared to the vertical, as a general thing. The purlin is framed at right angles to the slope for convenience in making the truss and rafter connections and not, as might at first glance appear, for greater strength. On this account it should be made broad as well as deep, otherwise it would deflect except as the rafters, when in place, might stiffen it if fastened at the bottom in such a way as to resist thrust.

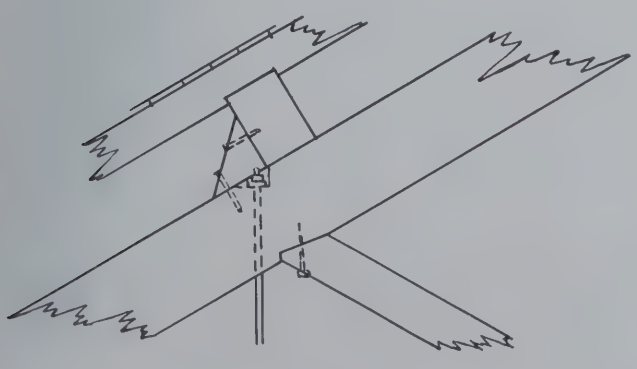


Fig. 15

A block of wood may be used as shown to brace the purlin and attach it to the truss. The location of the purlins should be at or near the joints of the truss to prevent bending in the top chord. The rod passes through the top chord and its stress is transmitted to it and the diagonal by a plate countersunk into the top chord to allow for direct horizontal bearing. The diagonal is notched into the chord and held in place by a screw or spike.

In making this notch there is an opportunity for some variation in design. It will be remembered that a previous article of this series pointed out

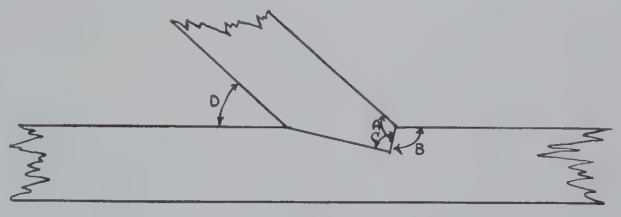


Fig. 16

that the allowable stress in bearing is much greater on the end of the grain in a wooden stick than across the grain. It follows that the allowable bearing on a surface inclined at an angle varies between these two extremes. This is frequently taken as a straight line variation which is probably good enough. In a standard engineering text book a formula was included giving a curve for this variation. A year or two ago in one of the professional publications the accuracy of the derivation of this formula was questioned. However, in the opinion of the author, this formula remains, in its final results, as good as has been proposed by anyone up to the present time.

When two sticks, as shown in Fig. 16, are framed

into each other in a truss a notch is made one side of which is considerably longer than the other. The short side resists the greater part of the stress in the diagonal. If the angles A and B are not equal it follows that a different allowable stress is obtained according to which stick is investigated and that the least allowable governs and determines the length of this short side. It is evident that the smaller this notch can be made the better it is as less material will be wasted in the lower chord. To obtain a minimum notch it is therefore necessary to make these two allowable stresses equal, which means that the angles A and B should be equal. It will be found that if the angle C is made a right angle this condition will be very nearly fulfilled for all ordinary cases. Also, if C is made a right angle, it is easy for the carpenter to lay out this joint when the length of the short side of the notch is given. This is the method preferred by the author but various designers vary this practice from making A a right angle to making B a right angle. When the angle D is not too great, or the unit stress in the diagonal too great, this notch is designed very simply by a curve adapted from the formula just mentioned.

As in all wooden trusses the end joint gives the greatest opportunity for study and it results in a great variety of design by different engineers. In Fig. 17 is shown the design of an end joint which is frequently used. Here two plates are used, one on either side of the truss. To these plates are riveted smaller plates—four in the drawing to each large plate. These smaller plates fit into

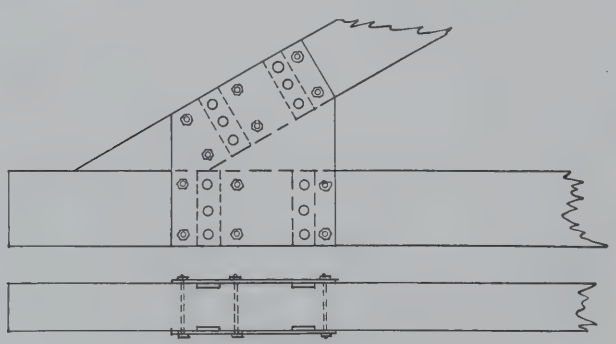


Fig. 17

notches in the wooden sticks. The heads of the rivets are countersunk into these small plates so that a good joint may be made easily. These plates are held in place on either side of the truss by bolts passing through the sticks.

The thickness of the small plates is determined by the stress in the two sticks. Sufficient area must be provided for the plates to bear against the ends of the grain in the sticks without over stressing the wood. The number of rivets to fasten the small plates to the larger are determined by these same stresses and the rivets are limited by their strength in shearing. The bearing will be sufficient for the rivets against the plates if the plates are $\frac{5}{16}$ inch or more in thickness and $\frac{3}{4}$-inch rivets are used.

The bolts do not take any figured stress but merely hold the plates in position. They can be made quite small, say $\frac{1}{2}$ inch in diameter. The chief stress which actually comes on them is tension due to the tendency of the large plates to buckle and they must be so placed as to resist this buckling to the greatest advantage. For example, the lower chord is in tension tending to pull it away from the joint toward the center. If this stress should be increased until the joint failed, and if it failed by the buckling of the plate, the end of the plates nearest the center would fly out from the lower chord allowing the small steel plates to come out from the notches. To resist this the bolts are placed just to the right or left of the small plates. This kind of failure was witnessed by the author a

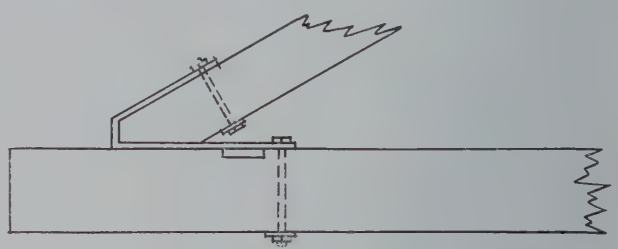


Fig. 18

few years ago when an unexpected stress was applied to a truss which otherwise, due to the factor of safety in the design, would have resisted this condition without serious injury.

In Fig. 18 is shown an end joint of a wooden truss where the stresses and sizes are smaller than would be required for a joint such as shown in Fig. 17. The principle is substantially the same for both types of design. Considerable variation in practice is found among different designers, especially in the placing of the bolts; some designers have inclined the bolts so that they would be normal to the diagonal member and have figured them to take direct stress. The author does not use this type of design for a truss of any size, due to uncertainties in the division of the stress between the notch and bolt.

When this type has been used a short stick has sometimes been added under the lower chord between it and the bearing. This member reinforces the lower chord where much material is cut out for the lugs and also helps to take care of eccentricity in the stresses at this joint. This stick has small plates inserted between it and the lower chord and notched into it to prevent slipping and the two should be securely bolted together.

In long trusses it is frequently desirable to splice the lower chord. If the splice is made properly it will often be found to be more economical to pay the higher price of one long stick; it can be accomplished more economically than in the case of a shallower truss with parallel chords, by choosing a point to splice somewhere near the middle where the stress is small.

MINOR ARCHITECTURE
EXEMPLIFIED IN MODERATE COST BUILDINGS

An Automobile Sales and Service Building

PRESTON J. BRADSHAW, ARCHITECT

THE improvement in the design and planning of sales and service buildings, as well as of structures of various kinds connected with the automobile industry, has been repeatedly noted in architectural publications during recent years, and countless instances where such structures have been given a distinctive architectural treatment prove that their owners, as well as their occupants, appreciate the fact that good architecture has a definite advertising and sales value which must be reckoned with.

A recently constructed building which possesses considerable merit from this viewpoint is the one occupying the north side of Locust street between 18th and 19th streets in St. Louis and occupied by the Weber Motor Car Co. and the Weber Implement and Automobile Co. The building is used for the sale of both new and used cars and it also contains departments for giving service and making repairs as well as work shops for the complete overhauling, painting and upholstering of cars.

The building is a three-story structure of reinforced concrete skeleton, flat slab construction, the first story of which is of terra cotta and the upper stories of kiln run red matt brick, the capitals of the pilasters and the frieze about the top being also of terra cotta. The necessity of having such a structure well lighted has resulted in its being, like Hardwick Hall, "more glass than wall," but the excellent handling of the brick pilasters between the large windows and the use of steel sash at the upper floor windows, with their surfaces well broken up into small panes, have given a pleasing effect. The building is heated by steam and every part is fully protected against fire by an automatic sprinkler system.

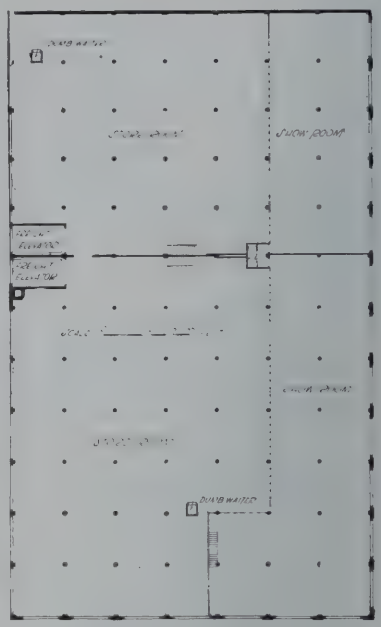
The arrangement of floor area in the building and the planning of the different departments have



Sales and Service Building for the Weber Motor Car Company, St. Louis, Mo.



View of Main Show Room

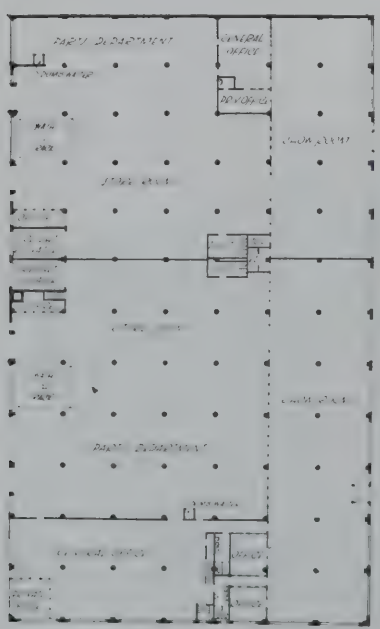


Second Floor Plan

proved to be economical of space and satisfactory for the various purposes which the structure serves. The front of each of the three floors, facing south and therefore well lighted, is given up to show rooms. The bays are 21 feet square and therefore but one row of columns extends through these departments. An elevator, entirely apart from those which serve the other parts of the building, connects the three show room floors and in both the first floor show rooms are several private offices which are often useful for receiving customers. Space on the 19th street side of the main floor is given up to general offices and a private office; this department has its own entrance from the street and is provided with two sets of toilets.

What might be called the service rooms, including the store rooms, parts department, repair rooms and other similar departments are entered directly from the alley at the north side of the building. Here are freight elevators to all floors, wash racks and dumb waiters to the different floors while at each of the motor entrances there is an office for the checking of vehicles entering and leaving.

The floors of the show rooms are of ceramic tile; clear maple has been used for the floors of the office portions and throughout the shop and factory sections the floors are of cement, monolithic with the reinforced concrete slab and hardened by the application of a liquid hardener. The building was erected entirely under the supervision of the architect's office from which sub-contracts for work of different kinds were placed.



First Floor Plan



General Office on First Floor



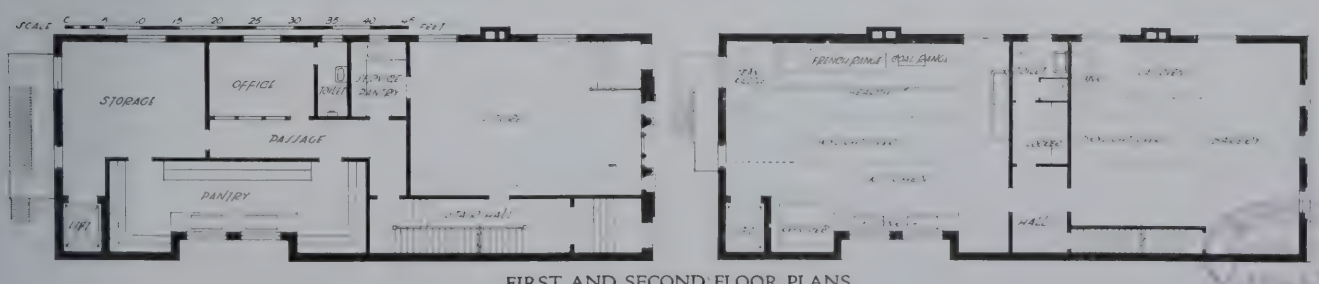
DETAIL OF MAIN FACADE

BUILDING FOR THE WEBER MOTOR CAR CO., ST. LOUIS, MO.

PRESTON J. BRADSHAW, ARCHITECT



STREET FACADE



FIRST AND SECOND FLOOR PLANS

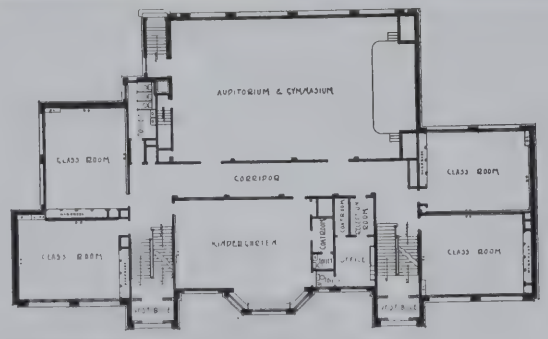
BUILDING FOR C. C. WHITTEMORE, CATERER, BOSTON, MASS.

ALLEN & COLLENS AND J. LAWRENCE BERRY, ARCHITECTS

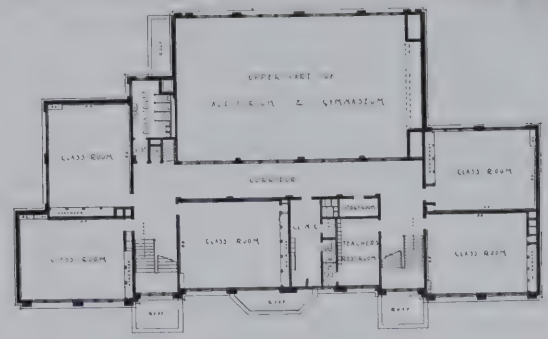




BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

JEFFERSON SCHOOL, SYRACUSE, N. Y.

JAMES A. RANDALL, ARCHITECT

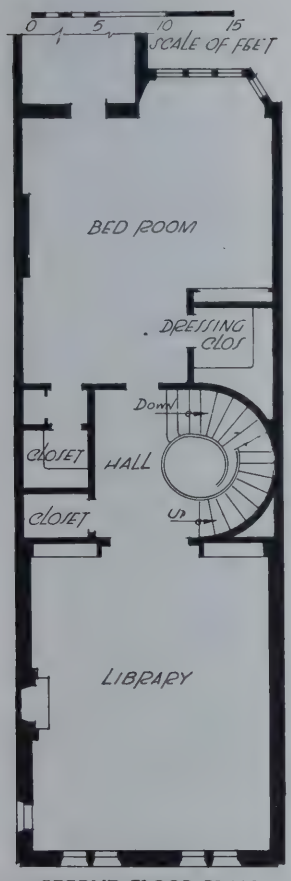




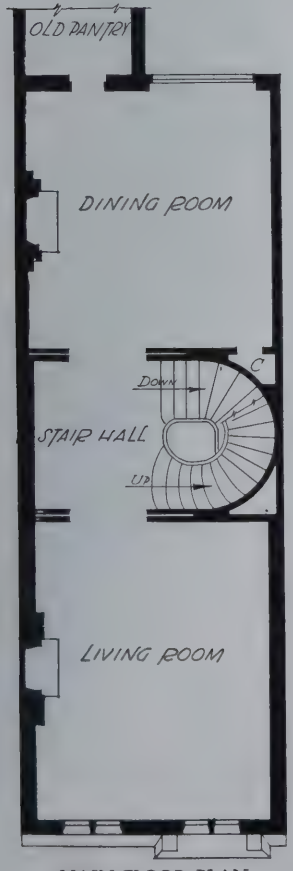
MAIN FLOOR PLAN AND GENERAL VIEW

EDWARD SMITH SCHOOL, SYRACUSE, N. Y.

JAMES A. RANDALL, ARCHITECT



SECOND FLOOR PLAN



MAIN FLOOR PLAN



STREET FACADE

HOUSE OF A. LEO EVERETT, ESQ., 70TH STREET, NEW YORK, N. Y

WALKER & GILLETTE, ARCHITECTS



SECOND FLOOR BEDROOM



DINING ROOM

HOUSE OF A. LEO EVERETT, ESQ., 70TH STREET, NEW YORK, N. Y.

WALKER & GILLETTE, ARCHITECTS

The Industrial Arts Exhibit at the Metropolitan Museum

NEW YORK, DEC. 15, 1920 TO JAN. 30, 1921

THE Metropolitan Museum of Art recently presented for public information an exhibit of furniture and decorations, consisting of stock reproductions and specially designed decorative fabrics based on originals from various collections at the Museum. With the co-operation of various manufacturers and dealers there were shown a number of types of period and modern furniture, tapestries, stained glass, screens and other decorative units of particular merit. A section of this exhibit is illustrated herewith.

An exhibit of this nature should demonstrate the particular value of good collections of art objects which are made available for public information. Manufacturers, in following the well established precedents of recognized periods or in modernizing and combining the artistic elements of the furniture and decorations of past centuries and decades, are also performing a valuable public service. With this help even modest homes may be given distinction in furnishing and decoration.

We have already discussed the advisability of an increased interest on the part of architects in this subject of furnishing and decoration. With the realization of the availability of an infinite choice of reproductions and well designed modern furniture and decorative units, it is evident that the architect has directly at hand an unusual means of expression which should encourage him to complete his work of building design by indicating the furnishing of at least the principal rooms of structures of various types, and particularly of dwellings. It must be discouraging to an architect to design an attractive dwelling with rooms in which the interior architecture is of excellent taste, and see owners place in these rooms either chromos and relics of the past having no artistic merits, or purchasing unattractive modern types of furniture which ruin the entire



View in a Section of the Industrial Arts Exhibit at the Metropolitan Museum, New York

effect which the architect has so carefully planned.

During the past few weeks we have had occasion to inspect interior photographs of different dwellings designed by a number of architects. It has been found that where the architect has taken little or no interest in the question of furnishing, practically every interior has been spoiled by the owner unless he has been possessed of sufficient means to call in a decorator who may or may not have carried out a scheme in keeping with the architect's conception. Where the architect has made a practice of following his structural design with either service or general advice on the subject of furnishing, almost all interior views in his office prove to be attractive. It would seem evident, therefore, that the architect's policy has much to do with the ultimate result of his work, and that architects have it within their power to do much toward encouraging owners to furnish their homes sensibly and artistically.



An Adaptation of Early American Design in the Morgan Wing of the Museum

In many instances the owner of a new dwelling or building of almost every type turns to the architect for advice on furniture if he wishes advice; and the architect, in turn, has his choice of carrying out the work or advising as to the employment of an interior decorator who will work under his supervision or in co-operation with him. For the present there is no generally standardized method of handling the business phases of such a transaction. This seems to be entirely a matter of judgment on the part of the architect. This work may be carried on by charging for time, by commission arrangement similar to that under which building plans are prepared, or by special arrangement with the owner through which an amount equal to the discount allowed by some dealers may be paid to the architect for service.



An Italian Reproduction



An English Reproduction

From Original Furniture in the Collection of the Metropolitan Museum of Art

Interesting Rooms of a Remodeled Colonial Dwelling

WILLIAM JOHN CHERRY, ARCHITECT

IN the development of domestic architecture probably no period has created such a definite impression on the mind of the American public as that which has resulted from the work of the architects and craftsmen of the English colonies. In successive waves, during the past 30 or 40 years, we have turned to other periods for inspiration in the design of homes, but always there remains the impress of the colonial precedent, based as it is on the simplicity which was the spirit of the times—devoid of elaborate ornamentation but artistically true in line, mass, unity and proportions.

Thus it is that new dwelling designs of the so-called colonial period or any project involving the restoration of early American architecture meets with unusual interest, particularly if the designer has developed new features in restoration methods or a new and logical application of old ideas.



A Corner of the Dining Room

There are presented here several illustrations of interesting rooms in the recently remodeled colonial dwelling of E. M. Bull, at Blooming Grove, New York. This project is of particular interest in that the old estate was a direct grant from King George III and in the course of the alterations many of the fine old features of the house, built in 1804, have been preserved. The entrance hall is typical of the colonial period and the stairway is that of the original house and offers an interesting suggestion for modern planning in this period with its easy wind half way up.



View of Stair Hall

In the dining room the mantel with its lighting fixtures is of particular interest. The furnishings are of modern type, not colonial, but carefully chosen because of their graceful lines to form a harmonious composition. This room, while preserving colonial simplicity, has a more modern atmosphere than any other room of the house.

Other illustrations show views of a particularly interesting room; this is the study in which particular care was taken to create an atmosphere of comfort while still preserving the elements of the old colonial dwelling. Among the unusual features which the architect has incorporated in this design may be noted the use of weathered timbers and lumber



Fireplace in the Study

from an old barn, which was on the premises, to form the beamed ceiling of the room. These hand-hewn timbers are a weathered gray and have not been stained or painted but left in the natural condition, providing an unusually attractive result. The walls of this room were carefully hand plastered in imitation of old stone plaster and an interesting note is added by the preservation of the old andirons and other fireplace fittings. All the furniture used could be duplicated from stock. The pieces were selected for comfort and because of the low, broad lines so in keeping with this restoration of a room of the early American period.

The bookcases shown in one of the illustrations are made up with specially designed hardware. The glass in the doors is of the hand pressed type, originally imported, and was in old buildings on the premises. Various pieces were collected and built into leaded panels. On the floor is a braided rag rug such as may be had in various sizes, and its use goes far toward carrying out the type of furnishing which the architecture of the old house demands. In furnishing a house of any definite period it is wise to select pieces such as were used at that time, and many pieces based on old models may be had.



Old Leaded Glass in Bookcase and Windows of Study

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

The Owner's Duty to the Architect

AT the present time practically every industry and every business is passing through a period of reconstruction. Old ways and methods pass. In the commercial world we have the long-heralded return to a buyers' market. Conservative financial institutions are developing and advertising the "service" resources of the financial world. In the architectural profession also a period of reconstruction is evident. As never before the value of sound business administration is recognized and its principles are being applied, not in a manner detrimental to the upholding of the dignity inherent to the profession but in a way which enables the architect to take his rightful place in the business world and to assume the responsibilities which broaden and become more intricate from year to year as the art or science of building progresses in almost unbelievable strides.

With intense interest and full appreciation of its value at this time we note the publication by the American Institute of Architects of a thorough treatise on business administration entitled "The Handbook of Architectural Practice." The opening paragraphs of the Handbook so clearly define and allocate business administration as an important factor that we quote briefly:

"It is as a fine art that architecture has established itself in the hearts of men. If it had been merely the science of building or even of building well, its appeal would not have brought to it minds such as those of Ictinus and Michael Angelo. To good building architecture adds high qualities of the imagination . . . but to treat of architecture as an art this Handbook does not aspire.

"The architect, though primarily an artist, must still be the master, either in himself or through others, of all the applied sciences necessary to sound and economic building . . . but it is not with construction nor engineering, nor with the choice of materials that this Handbook deals.

"The architect, by expressing his ideas in forms and words of exact contractual significance, by controlling machinery for their embodiment, by giving just decisions between conflicting interests, by bearing himself as worthy of his high calling, gives to his art the status of a profession. It is with that aspect of the architect's work, professional practice and its servant, *business administration*, that this Handbook is concerned."

Thus clearly does the Institute emphasize the importance of applying proper business methods and procedure in the conduct of the architect's affairs. Much has been said and more written on the subject of the architect's duty to the owner, but the owner's duty to the architect has never received sufficient consideration. In many instances the failure of the owner in this respect has led to direct financial loss or to the development of unnecessary misunderstandings and failure to establish that active co-operation so necessary for the successful completion of a building project. The "Handbook" expresses full realization of this fact. It is the purpose of this article, however, to correlate suggestions made therein and to add such facts as may have been gathered through experience and contact with various architectural projects and organizations.

Realizing What the Architect Does

The first duty of an owner who is about to engage an architect is to learn fully what is included under the term "architectural service." The American Institute of Architects thus defines the professional services of the architect:

"Necessary conferences; the preparation of preliminary studies (sketch plans and reports); working drawings; specifications; large scale and full size detail drawings; the drafting of forms of proposals and contracts; the issuance of certificates of payment; the keeping of accounts; the general administration of the business and supervision of the work."

It is evident therefore that the work of the architect is far more than that of an artist, and that in paying the fees charged by architects the owner is paying not only for design but for a vast amount of detailed work involving every part of the building and its equipment; cost estimates; arrangements with contractors; accounting and numerous other activities involving a high degree of skill and special knowledge.

An owner will do well also to realize that the architect's fee is not all profit nor are his expenses on a project trivial in nature. What proportion of an architect's fee is profit depends entirely on the volume of his business and his organization methods but we venture the assertion that the average net profit on architectural work is less than that of the

real estate broker who may sell or lease the building after it is finished. Full information as to standard charges and documents may be obtained from the American Institute of Architects or by addressing the Editor of THE ARCHITECTURAL FORUM. It is important therefore that the architect should explain to an owner the full nature of his work in order that understanding may be clear on this point.

A Definite Agreement before Work Progresses

We may pass briefly over the point of selecting the architect. This is done by the owner either as he would select a lawyer or a doctor, by competition, or because some architectural organization actually "sells" its service to him. The important point is that the owner should be satisfied before closing an agreement that the architect he has selected is capable of carrying out the work to his satisfaction. "Swapping horses in midstream" is the poorest kind of policy in connection with a building operation and is always expensive to the owner.

An architect is entirely within his rights in requiring a definite written agreement before he starts work on the design of a building of any type. This is simple and sound business practice and it is the owner's duty to sign such an agreement for his own protection. The agreement need not bind the owner to proceed with the building operation, but it should:

1 — Definitely employ the architect to carry out such work as may be authorized in writing by the owner from time to time.

2 — Specify the amount and method of payment for architectural service (*a*) As the work proceeds; (*b*) If project is abandoned.

Note. See standard form of agreement between owner and architect prepared by American Institute of Architects.

3 — Define such expenses as may be reimbursed to the architect by the owner: travel, special engineering service, etc.

At the present time many projects are undertaken by architects without any definite agreement of legal value. Much misunderstanding results from this condition. The architect who insists on an agreement shows only good business judgment which in turn will prove of benefit to his client.

A Clear Understanding of the Project

When a client takes a case to his lawyer, or when a doctor is called in to prescribe for illness, every possible fact and condition is presented in order that this professional service may be successful in its application to the immediate problem. Similarly, when an owner calls upon an architect to undertake the solution of a building problem it is his duty to acquaint the architect with all possible details which may affect the design and construction.

Unless an owner has special knowledge of the subject he should not interfere with the artistic elements of the design. This is one of the problems which he presents to the architect, who presumably has more knowledge of the subject. The owner should think of his proposed building more as a machine than a work of art. The architect will provide the artistic elements, but he cannot guess at the actual functioning of the machine as required by the owner. Whether it be a dwelling, hotel, office building or factory, it is the duty of the owner to outline completely his major requirements before sketch plans are made, and to have these clearly in mind as he studies the preliminary drawings and the working drawings as the architect's work proceeds.

This is a point which cannot be too strongly stressed. The wise owner will therefore enter into the work of the architect in a spirit of co-operation. For the time being they are business partners, mutually interested in achieving the best results obtainable. Consequently there should be no hesitation on the owner's part in calling into consultation any of his associates, employés or special technical advisers who may be directly interested in the functioning of the building *after* it is completed. The architect cannot be fairly expected to know the details of every business or menage. He is expected to know how to translate these requirements into building terms and plans after he is made aware of them and to seek (at the owner's expense and with his permission) advice on such highly technical details as may not lie directly within his province.

Necessity of Co-operation

If the building in question is a hotel, it is the owner's duty to call for advice from those who will actually manage or lease it upon completion. In the case of an office building the rental agents or building managers should be called upon to approve the plans while in preliminary form. This idea extends to all types of service buildings including even the larger residences.

The architect, therefore, should recognize this as a duty which the owner owes to him. If he does not do so there may be several unpleasant results. The plans after completion may reach an associate of the owner who because of his relation to the project may severely and justly criticise details expensive to alter. In an investment project the managers or real estate brokers may, as they have in thousands of cases, point out costly mistakes in planning after the building is completed and blame the architect with consequent injury to his reputation. So too the owner's refusal to allow the architect to call in special engineering advisers on important problems may prove expensive in the end. It is the owner's duty to expect neither superhuman knowledge nor achievement from the architect and to realize that the architect's advice on the employment of consulting service is not given if such

service can properly be expected as part of his organization equipment. On the other hand it is fair for the architect to advise the owner in advance (or when preliminary plans are completed) what special consulting service will be necessary.

Duties of the Owner

As to the provision of all facts and conditions affecting the land involved in a given project, this is the duty of the owner. We may turn to the Handbook for definite advice in this matter:

"The owner shall furnish the architect with a complete and accurate survey of the building site, giving the grades and lines of streets, pavements and adjoining properties; the rights, restrictions, easements, boundaries and contours of the building site, and full information as to sewer, water, gas and electrical service.

"Many instances of trouble and expense due to the failure of the owner to furnish complete and accurate information might be cited, but one will suffice. In a recent case the owner furnished the architect with a survey covering all the usual data and such restrictions as were *of record*. The property, however, did not belong to the company erecting the building, but had been leased in three parcels for 99 years. The leases had not been recorded. They provided that in the event of the improvement of any parcel in conjunction with another the columns were to be so located on the dividing line as to form "party columns." The architect prepared sketches and working drawings in ignorance of these restrictions and it was not until the contract had been awarded that he was casually notified that the columns must conform to the lines of the several parcels. The owner had to bear the cost of re-making the drawings, $5,000, and of the necessary changes in the building, $84,000."

The architect, of course, is responsible for making certain that the design and all details of plan are in accordance with all building laws, codes and departmental rulings having application to the location in question.

The Question of Cost Estimates

One of the contact points at which most of the misunderstanding between owners and architects is started is to be found in this question of preliminary and detailed cost estimates. Usually an owner has clearly in mind the amount of money which he is able and willing to spend on a project and it is his duty to inform the architect definitely on this matter rather than to approach the subject vaguely. On the other hand, it should be more generally realized by architects that in regard to this question of cost the owner is almost entirely dependent upon the architect.

During the past few years it has been unusually difficult to estimate costs owing to the disturbed condition of the labor and material markets. Perhaps it will be found, however, that many architects have made cost estimates without sufficient care. Certainly a great many owners have been disappointed in the comparison of ultimate costs with estimated costs, and in many cases part of the fault may be charged to the architect.

When an architect is commissioned to draw the plans for a building and has received from an owner an approximate figure as to the cost which he is willing to bear, it is the duty of the architect to gather all possible information on recent costs of buildings of this type, not relying entirely on experience in his own office unless it has been extensive, but seeking advice of builders and other architects who have designed structures of a similar nature. The owner, however, should realize that owing to the conditions which have been referred to there may be considerable difference in the architect's estimate and the contractor's bid (the ultimate cost of the work) due to conditions beyond the control of the architect, such as transportation difficulties, labor troubles and other expensive delays, as well as to the failure of material dealers and sub-contractors to live up to contracts and agreements, an experience common under present conditions. The owner should consider carefully the nature of the building market and realize that the architect is trying to give the best possible service.

Importance of Preliminary Figures

There have been cases where architects have given preliminary estimates much too low which have had every appearance of attempts to encourage construction. This policy, which is both dishonest and unbusinesslike, is always attended by unfortunate results, and the profit which may be made through such an operation is more than lost in damaged reputation and unpleasant advertising. Cases of this type are few and it will invariably be found the best policy to apprise the owner fully of all facts and conditions relative to the cost. In making estimates both the architect and the owner should allow a liberal safety factor to cover unexpected costs. In this matter the owner can do much toward co-operating with the architect if he will but take an intelligent interest in the subject such as is warranted by its importance to him, and allow the architect any necessary preliminary expenditures which may be required to develop dependable cost estimates.

In this connection we may note the fact that there will be published occasionally in the Service Section of THE ARCHITECTURAL FORUM a tabulation of cubic foot costs of various types of buildings in different sections of the country which is intended to serve as a guide to architects in making preliminary estimates for sketch plans or, inversely, in determining the approximate allowable number of cubic feet in accordance with the amount of money which the owner is willing to spend on a project under consideration.

As the Work Proceeds

The owner, for the protection of his own interests, should follow all important points brought out in working drawings and specifications as the plans are being developed. It is not difficult to follow these details with the architect's explanation and the owner will be in a position to know exactly what materials, methods, equipment and details of planning will be incorporated in his building before it is constructed. By following these matters closely and by visualizing in a practical manner, the owner may prevent results which are not satisfactory to him. This is an important point as the owner is called upon to approve all working drawings and specifications, and such approval applies to every detail indicated therein. It is unfair to the architect for an owner to criticise important details of finished work if the owner has not given fair consideration to the plans while in the stage of development. If it necessitates models to carry a preliminary point, their secondary function is to eliminate future differences.

It is self evident that another of the owner's duties is to carry on all business relative to the equipment and construction of the building, through the architect. There have been many instances of an owner negotiating direct for the construction of a building or on sub-contracts, issuing orders on the job or in other ways interfering with the regular schedule of the work. Sub-contractors and others who may have arranged definite agreements through the architect are naturally placed in a position to charge for extras, ordered by the owner, and any issuing of contradictory orders or approval in changes of plans and specifications by the owner tends to confuse the issue and to increase building costs.

This does not mean that the owner should not examine the job as it progresses or that he is precluded from finding fault with conditions which do not meet with his approval; but it is his duty to carry out all changes and to make all complaints to and through the architect rather than directly in contact with builder, sub-contractor or supply dealers.

In arranging building and sub-contracts the owner will find that he has much to gain by keeping somewhat in the background and in carrying on negotiations through the architect. In one sense this situation is similar to that of a real estate transaction where the principals do business through brokers who are in a better position to negotiate and to know when the principals should be brought together.

The Architect's Responsibility

If the contract is to be let on a service basis (cost plus a fixed fee), the architect's duties and responsibilities are greatly increased. Similarly, if the project is carried on through the letting of several contracts for various parts of the work the architect practically occupies a position of general contractor, in which case his fee and expenses will naturally be increased. If the work is let on a straight contract basis it is well for the owner to realize that the lowest bid may not be the best bid, and that the architect's opinion, gained through inquiry as to the work of various contractors, or through knowledge of their work, is of importance. Many owners make the fatal mistake of insisting on bringing in contractors, met through a social or business relationship, who may not be well fitted by experience or knowledge to carry out the type of work involved.

There are, of course, many instances which arise as the work progresses in which the owner may show a fair minded spirit which will be appreciated by the builder and by the architect. The owner must realize also that as between the building contractor and himself the architect is really an arbitrator whose duty it is to see that the various agreements are carried out in fairness to both parties and who will not hesitate to tell the owner that he has taken an unfair position if this be true. Therefore, the owner must not expect the architect to exhibit any false loyalty in dealings with the contractor and sub-contractors. The owner should realize also the importance of making all payments when and as agreed and that if this is not done the architect is placed in a difficult position, expensive delays often developing as the result of any slow payment policy.

It is evident that the owner who fully realizes his duties and who strives to develop and maintain the proper spirit of co-operation with the architect has much to gain. It is very difficult for an architect to work enthusiastically if he is forced to worry about the attitude of the owner. It may be readily understood that without enthusiasm an architect cannot do his best work.

For the period during which the structure is being planned and built the architect is in practically every sense a business partner of the owner. He is working for the same results, and if the owner will but consider his duties as the duties of one associate to another he will not only fully appreciate the work and responsibility of the architect, but he will do much toward expediting the work and guaranteeing his own satisfaction.

PLATE DESCRIPTION

Memorial Tablet to John Pierpont Morgan. Plate 21. Against the northwest pier supporting the central dome of the main hall of the Metropolitan Museum has been recently erected a sculptured tablet in memory of the late President of the Museum. In 1914, shortly after Mr. Morgan's death, this important commission was entrusted by the Trustees to Paul Manship, sculptor, and upon its execution he has spent the last six years. The memorial tablet takes the form of a stone slab, 11 feet 2 inches in height by 5 feet 4 inches in width, with a projection from the wall of 6½ inches. Champville stone, which comes from France, has been used. This material, which belongs to the limestone family, possesses a fine grain and lends itself well to detailed sculpture in relief.

House of A. Leo Everett, Esq., 70th Street, New York, N. Y. Plates 31, 32. Many of the most successful alterations of city houses involve the removal of old fashioned high stoops and the placing of the new main entrances upon what was previously the basement level. The advantage of this, as is well known, is that it makes possible a dignified entrance, using valuable space which was often practically wasted, and leaves the entire width of the building upon the front of the main floor available for a drawing room or a living room. The residence shown here, of which Walker & Gillette are the architects, is an interesting case of this kind. A new facade nearer the sidewalk gives ample hallway and the removal of old partitions has given opportunity for spacious stair hall, living and dining rooms upon the main floor, and for a library and a master's bedroom, the full width of the house, upon the floor above.

The design of the facade has been worked out with brick laid in Flemish bond, with trim of limestone and sheet metal for the uppermost floor.

House of Rev. William M. Crane, Richmond, Mass. Plates 25, 26. This residence in the Berkshire Hills shows an advantageous use of plastic materials, cream gray stucco on terra cotta block having been used for the walls of the structure, reinforced concrete for foundations and for the retaining walls of pergola and terrace, and red Spanish tiles for the roofs, while the floors of vestibule, loggia, stair hall and pergola are laid with dark red domestic tiles. One interesting detail of planning is the placing by the architects, Kilham & Hopkins, of all the service rooms in one part of the building where pantry, kitchen, servants' dining room and four sleeping rooms, with a bathroom, are installed upon the main floor which makes the entire upper floor available for the family and guests.

Building for C. C. Whittemore, Caterer, Boston, Mass. Plate 28. This structure, of which Allen & Collens and J. Lawrence Berry are architects, was carefully planned for the exclusive use of a caterer and the result is a building which includes every convenience. Since show windows, in this instance, are neither necessary nor desirable, the facade has been given a treatment which does not suggest a shop. Cast stone is the material used with rondels of verde antique marble at the sides of the Palladian window which is the dominating architectural feature of the front.

Plans show a main floor arranged for the business of a caterer while the entire second floor is given up to bakery and kitchen, well equipped with refrigerator, ovens, sinks and other necessary details and connected by lifts with the ice cream department in the basement. Here every possible provision has been made for efficient service and this department is equipped with refrigerators, ice cracking machine, salt bin, mixing bin, steam kettle, mould room and freezing machinery and complete facilities for prompt delivery service.

Jefferson School, Syracuse, N. Y. Plate 29. In this building, planned by James A. Randall, architect, considerable attention has been paid to providing complete equipment in a school of moderate size. The plates show an exterior of brick, simple and direct, two full stories and basement in height. Upon the basement floor are placed two sets of playrooms, lockers and toilets, one for boys and another for girls, with the necessary showers and boiler room and a fan room to provide adequate ventilation. Besides a large kindergarten room there are nine class rooms, a clinic, a rest room for teachers, office and reception room for principal, and a large auditorium and gymnasium the height of two full stories.

The class rooms, it will be noted, are so planned that light falls upon the students' desks from the left. This school will accommodate 400 pupils and was built during 1917 and 1918 at a cost of $147,950 which included complete furnishings.

Edward Smith School, Syracuse, N. Y. Plate 30. An unusually large plot in a new district afforded the architect, James A. Randall, an opportunity of planning a school of fair size upon one floor. Here there are 12 class rooms besides auditorium and gymnasium, kindergarten, rooms for manual training, sewing and domestic science, fresh air room with porch and such conveniences as teachers' rest room and offices for medical director and principal.

All of these departments being on one floor, the architect has placed the large open space of the auditorium and gymnasium at the center of the building with class rooms grouped around it, thus minimizing the extent of corridors, otherwise necessary in a building covering such large area. The boiler room is placed in the part of the building least valuable for other purposes. The school presents a pleasing appearance and is built of brick with certain parts coated with stucco. It provides for 550 pupils and was built during 1917 and 1918 at a cost, entirely furnished, of $203,000.

EDITORIAL COMMENT

ARCHITECTS AND ORGANIZATION

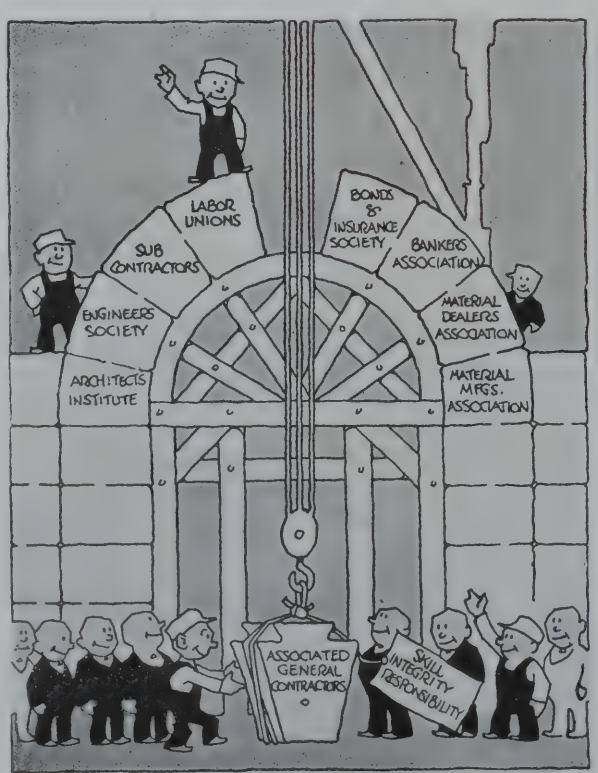
THE value of organization was demonstrated beyond question during the war and it is, therefore, to be counted a real and active factor in our present social, business and professional affairs. Without it little can be effectively carried out where the interests of a group are involved. Organization, unfortunately, may at times be wrongly used; we have seen as the result of various investigations the power that organization may exert to the detriment of the public when that power is used in a business sense to restrict competition and production and to fix prices. The existence of organizations that are inimical to public interests does not, however, condemn the organization idea; it merely indicates that group action is a present day factor and that organizations with evil intent must be opposed by other organizations guided by higher principles.

The practice of architecture presents an example where organized effort is eminently desirable and necessary. Architects constitute a profession that holds the highest ideals of service to the public; their ethics, unfortunately, are not generally understood or appreciated by the public at large and without proper explanation wrong conceptions of the architect's function and service are inevitably formed. The movement for licensing the practice of architecture creates a condition in which the individual architect has little opportunity to express approval or disapproval on a matter of vital importance to his welfare. These and many other reasons make the association of architects necessary, if only from the viewpoint of protecting professional status.

Architects have, however, a larger incentive for association. It is the advancement of architecture as a fine art. Upon this ideal the American Institute of Architects was founded many years ago when the profession in this country was in the early stages of development. The unselfish, high principled ideals built into the Institute by its founders have assured its continued growth and it presents today a firm foundation upon which a really great Institute should be raised.

A greater Institute is not suggested in any criticism of past efforts for one has only to reflect on the practice of architecture today and conjecture what conditions might be with respect to competitions, professional fees and the code of professional ethics were it not for the work of the Institute, to realize its worth. New problems, however, continually arise that demand careful and deliberate thought and we should not rest content with past endeavors. In these days of reconstruction influences are at work that will require of the Institute greater activities in the future than in the past. These activities will be in scope and effectiveness in proportion to the support accorded the Institute by the profession.

The effectiveness and prestige of an organization may be judged by the measure of recognition accorded it by others. It is of interest to note, therefore, in the cartoon reproduced below, the relative position accorded the Institute by one of the newest organizations to be established within the building industry. This appeared in *The Bulletin of the Associated General Contractors* for January, 1921 and indicates the function which this new organization, scarcely two years old, feels called upon to fill. If it appears that a dominant organization is lacking in the building industry credit only must be given those who seek to eliminate the deficiency. We believe, however, that the Institute should represent to the building industry generally a higher importance than this cartoon accords it. It has the dignity and impressiveness of age back of it; it is composed of men who should be by nature of their profession the acknowledged leaders of the construction world. Still, something is lacking; it does not function in the public eye as it should.



The reason is not far to seek; the Institute, while representative of the profession in a general sense, does not represent the whole body of architects because its members are only a minority of practicing architects. It should be made truly representative so that it may have the support to which it is entitled; and it can be made truly representative only if every architect makes the welfare of his profession a matter of personal interest.



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CERAMIC BUILDING COMPETITION

FOR the proposed Ceramic Building at Rutgers College, New Brunswick, N. J., the manufacturers of terra cotta have offered the gift of their material and to arrive at a design characteristic of terra cotta they arranged in conjunction with the architect of the building, F. H. Bent, for a competition among the architectural draftsmen of the various companies. Awards as follows have been recently made: the first prize of $200 to E. W. Moell, Rocky Hill, N. J., and the second, $100, to S. R. Audsley, Perth Amboy, N. J.

CATALOG REVIEW

INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION, Bedford, Indiana.

"Indiana Limestone." Vol. I (6x9 ins.). 36 pp.

This book would be interesting to any extensive reader but prepared for the architect and his client as it is, there is included only what information would determine its general fitness for structures about to be erected. Texture and tooled finishes are explained. Phases of quarrying and transporting large blocks are presented. Facilities for working the stone to elaborate detail and the ability of members of the association to co-operate with users of their product is pointed out. Color, strength, elasticity and resistance to the ravages of time are a few of the qualities that are touched on by the text. Illustrations printed in brown are numerous and show besides many fine pieces of architecture and sculpture, a few intimate pictures of Indiana Limestone in production.

"Indiana Limestone Bank Book."
Vol. IV (6 x 9 ins.). 48 pp.

Besides covering many of the main points of volume one, this book specially advocates the use of "The Aristocrat of Building Materials" for bank buildings. Limestone, not alone for exteriors but interiors as well, are suggested for this type of construction. Many new and old banks are shown both in large and small communities. A long list of names and localities make it comparatively easy for the reader to find a bank of limestone which may be seen without traveling far.

Advice on Acoustics
GEORGE C. HANNAM
Acoustical Engineer
1400 Broadway - - New York, N. Y.

ANNOUNCEMENTS

Mr. Werner E. Melinder announces the opening of an office for the practice of architecture at 229 Metropolitan Bank Bldg., Fifth and Cedar streets, St. Paul, Minn.

Mr. W. E. Gore wishes to announce that his offices are now located in the City National Bank Bldg., Paducah, Ky. Manufacturers' catalogs and samples requested.

Damon, O'Meara & Hills, 19 East Mason Bldg., Fort Dodge, Iowa, announce the opening of an office in Suite 1123–24 Merchants National Bank Bldg., St. Paul, Minn. Manufacturers' catalogs and samples requested.

The architectural practice formerly carried on under the firm name of Bollard & Webster, 520 Paxton Bldg., Omaha, Neb., will be conducted in the future by James R. Webster at the same address.

John P. Kingston & Son, architects and engineers, whose offices at 518 Main street were recently destroyed by fire, announce the opening of their new office at 220 Park Building, Worcester, Mass. Manufacturers' catalogs and samples requested.

Mr. Bernard Wiseltier, landscape architect, formerly with Vitale, Brinckerhoff & Geiffert, announces the opening of offices at 15 East 40th street, New York, N. Y., for the practice of his profession.

Mr. P. S. Clark, architect, announces the opening of an office in the Krise Bldg., Lynchburg, Va. Manufacturers' catalogs and samples requested.

Mr. Joseph J. Taylor, architect, formerly architectural engineer in the office of the Mechanical Engineer for the Bethlehem Shipbuilding Corp., Ltd., announces the opening of offices at 216 E. Lexington St., Baltimore, Md. Manufacturers' samples and catalogs requested.

Mr. Robert O. Derrick, architect, formerly with Murphy & Dana, architects, New York City, has been admitted as a partner to the firm of Brown & Preston, architects and engineers of Detroit. The firm has been incorporated under the name of Brown, Preston & Derrick with offices at 406–7–8 Empire Bldg., Washington Boulevard at Clifford street, Detroit, Mich.

A CORRECTION

Through an error in preparation of copy the standard size of brick was incorrectly given in the advertisement of the Common Brick Industry of America in the January 1921 issue. The correct size is 8 x 2¼ x 3¾.

THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 3

CONTENTS for MARCH 1921

PLATE ILLUSTRATIONS

	Architect	Plate
MEMORIAL AMPHITHEATER, ARLINGTON, VA.	*Carrere & Hastings*	33–36
HOUSE OF EX-PRESIDENT WOODROW WILSON, WASHINGTON, D. C.	*Waddy B. Wood*	37–39
ADDITION TO DORMITORY QUADRANGLE, WELLESLEY COLLEGE, WELLESLEY, MASS.	*J. A. Schweinfurth*	40, 41
GATE AND CHAPEL, TOD HOMESTEAD CEMETERY, YOUNGSTOWN, OHIO	*J. A. Schweinfurth*	42, 43
GROUP OF CITY HOUSES, NORWOOD GARDENS, QUEENSBORO, N. Y.	*Walter Hopkins*	44
SUPERINTENDENT'S HOUSE AND OFFICE, AMAWALK NURSERY, AMAWALK, N. Y.	*James E. Mackenzie, Jr.*	45
HOUSE OF R. W. LANGLEY, ESQ., NEW HAVEN, CONN.	*C. F. Townsend*	46
CHESTER CLUB, CHESTER, PA.	*Clarence W. Brazer*	47, 48

LETTERPRESS

	Author	Page
COVER DESIGN, RUINS OF CHATEAU AT CHINON, FRANCE Drawn by O. R. Eggers		
THE EDITORS' FORUM		53
CHURCH TOWER, MEXICO CITY	*Frontispiece*	
VILLAS OF THE VENETO II. The Villa Cerato at Montecchio, Precalcino	*Harold Donaldson Eberlein and Robert B. C. M. Carrere*	77
II. IMPRESSIONS OF THE COLONIAL ARCHITECTURE OF MEXICO	*Walter H. Kilham*	85
THE ARLINGTON MEMORIAL AMPHITHEATER Carrère & Hastings, Architects		91
DEPARTMENT OF ENGINEERING Terra Cotta Roofing Tile, Part II, Alfred Lo Cascio Truss Design and Details, Part V, Charles L. Shedd, C.E.		97
MINOR ARCHITECTURE DEPARTMENT A City House Development of Greater New York Walter Hopkins and Philip Resnyk, Associate Architects		103
DECORATION AND FURNITURE DEPARTMENT Interior Decoration Commissions Furnishing of Community Buildings under Limited Expenditure		105
BUSINESS AND FINANCE DEPARTMENT Business Aspects of a Successful Co-operative Apartment Development		109
EDITORIAL COMMENT Encouraging Home Building		114

ALBERT J. MacDONALD, Editor

Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.

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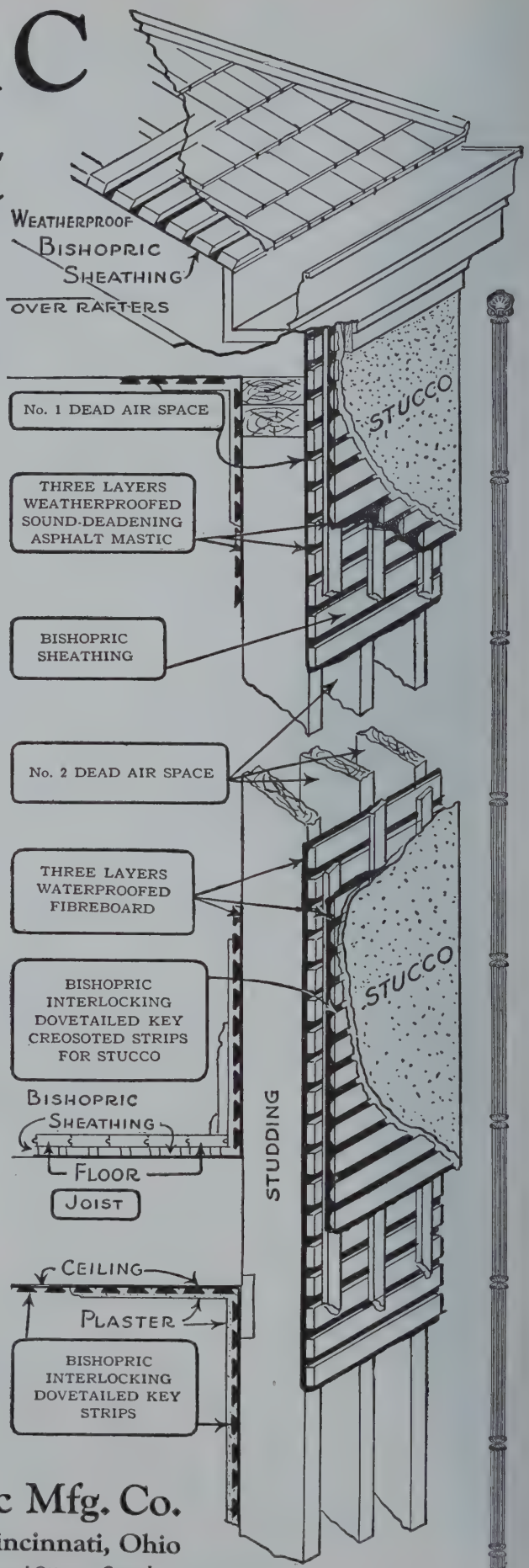
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THE EDITOR'S FORUM

CONSTRUCTION ACTIVITY BEGINS

THE long expected turn in construction affairs may confidently be said to have materialized. Evidence of continually strengthening demand, and what is more, evidence of construction actually getting under way, comes from practically all centers.

This is largely due to a belief that liquidation in the building material market has about run its course and that the present retail prices are as near production costs as they can safely go. It is also felt that with any prospect of continued demand for building materials prices will show a tendency to rise, although statisticians make the prediction that after the present building season some further price reductions may be expected. In view of these conditions there are but two courses open to the prospective builder—one to go ahead now and take advantage of present opportunities, and the other to wait. The demand for building space, however, is so great and the assurance of good rental returns for a number of years is so generally expected that the first course will be adopted by many.

The fact that building has already shown a strong tendency toward reviving is noted by the Dow Building Service which covers building conditions in the vicinity of New York. The report of March 5 says:

"With due care to avoid even the appearance of vaporish optimism the Dow Service unqualifiedly proclaims that the long expected turn in the building construction market has come.

"Its regular canvass for building information in New York and vicinity has been supplemented for the purpose of making this survey by an exhaustive questionnaire issued to all departments of the building construction industry and the most conservative conclusion adduced therefrom is that New York has definitely started upon the most active habitation building program of recent times.

"In Manhattan epochal apartment house projects are in process of being forced to early completion. The tax-exemption ordinance has put cheap apartment house and tenement house sites back upon the market with a suddenness that is staggering."

This is further borne out by the building statistics for the month of February as compiled by the F. W. Dodge Co. covering the central and eastern sections of the country. The February figures show a gain of 69% over January, based on reports of building permits from 196 cities and representing a total valuation of $96,493,229. The total number of permits in February, 1921 is larger than that of the corresponding month a year ago but the valuation is smaller, indicating that present activity is less restricted and includes a large proportion of moderate cost work.

OWN YOUR HOME SHOWS

THE one outstanding need today is the construction of new homes, and architects should keep in touch with the more favorable circumstances for home building which are developing steadily. One of the most constructive efforts that is being made to stimulate the early construction of houses is the Own Your Home Expositions which will be held in Chicago during the latter part of March and in New York the latter part of April.

These expositions are arranged to appeal to the popular mind and, through the participation of manufacturers and others interested in the business that will develop from home building, the prospective owner is enabled to see in definite form all of the many materials and appliances that are used in the construction of the modern house.

In connection with the present expositions a feature of particular interest to architects is the competition which has been conducted among architects and draftsmen of the country for designs of 4, 5, and 6-room houses in brick, frame and backplastered metal lath and stucco construction. The wide interest that was taken in this competition is evident from the 1,200 drawings received.

The jury of award, comprising C. H. Hammond, Chicago; Edwin H. Hewitt, Minneapolis; E. J. Russell, St. Louis; Hal F. Hentz, Atlanta, and Dwight James Baum, New York, awarded these prizes:

Frame Houses

1st prize, Louis Justement, Washington, D. C.
2nd prize, J. Ivan Dise and E. J. Maier, Detroit, Mich.
3rd prize, Edmund F. Jacques, Detroit, Mich.
4th prize, Walter F. Bogner and Carl A. Rehse, Milwaukee, Wis.

Brick Houses

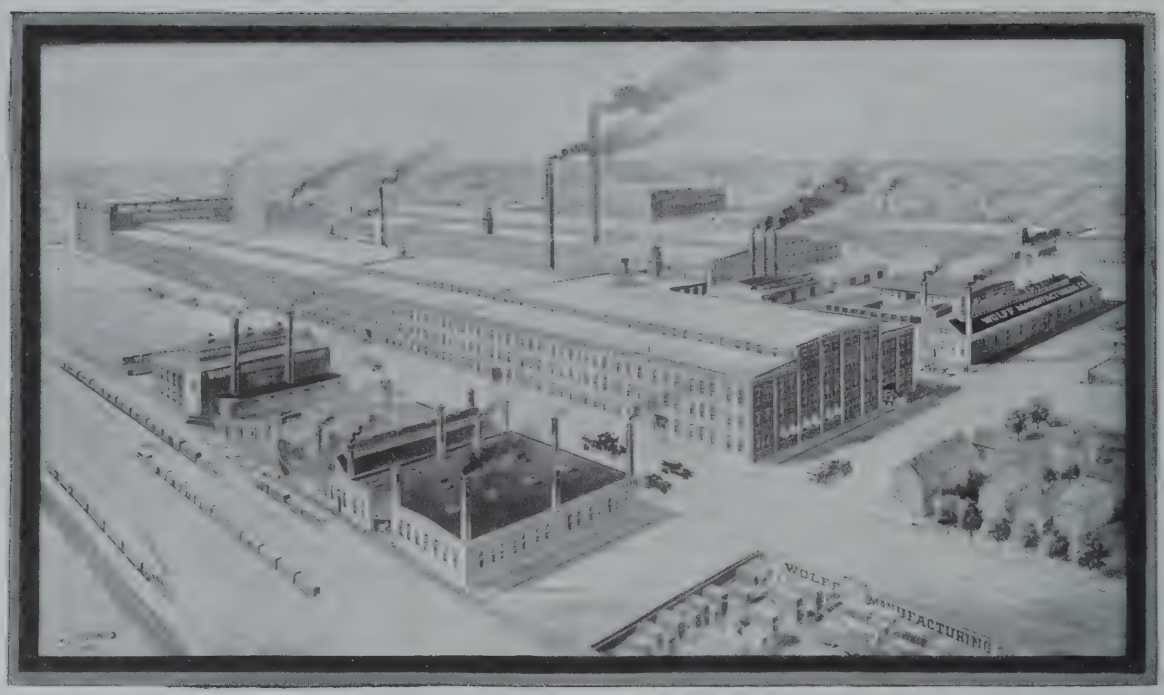
1st prize, Edgar and Verna Cook Salomonsky, New York, N. Y.
2nd prize, John Barnard, Boston, Mass.
3rd prize, Henry F. Stanton and Charles Crombie, Detroit, Mich.
4th prize, Anslie M. Ballantyne, New York, N. Y.

Metal Lath and Stucco Houses

1st prize, Louis Justement, Washington, D. C.
2nd prize, Amedo Leone, Detroit, Mich.
3rd prize, Montgomery & Nibecker, Los Angeles, Calif.
4th prize, Theodore Visscher and James Burley, New York, N. Y.

Group prize designs which were awarded competitors submitting the best house of one classification in each of the materials were awarded to:

John Floyd Yewell, New York City.
J. Ivan Dise and E. J. Maier, Detroit, Mich.
Richard M. Powers, Boston, Mass.



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"Impressions of the Colonial Architecture of Mexico"

CHURCH TOWER, MEXICO CITY

The
ARCHITECTURAL
FORUM

VOLUME XXXIV MARCH 1921 NUMBER 3

Villas of the Veneto

II. THE VILLA CERATO AT MONTECCHIO PRECALCINO

By HAROLD DONALDSON EBERLEIN AND ROBERT B. C. M. CARRÈRE

THE Villa Cerato, at Montecchio Precalcino, is an admirable example of a small house in which Palladian formality and dignity are quite as carefully embodied as in a structure of far greater extent. The villa is only 50 feet in breadth by 38 feet in depth. The elevation discloses a basement, a main floor, raised about eight feet above the ground, and an attic or top story, all of them very clearly expressed externally. There are none of the usual dependencies or farm buildings that were apt to be grouped closely around the master's house or to connect with it by an orderly arcaded scheme in Palladian fashion, so that it stands quite alone and unaided by any of those structural adjuncts calculated to dignify the composition. Nevertheless, despite its inconsiderable extent, the villa possesses a character that compels attention and respect.

The villa is close to the road and is approached by a short, straight drive through an unpretentious courtyard to the entrance. This consists of a flight of steps ascending to a shallow loggia entirely without the columns, entablature, or other formal features of architectural embellishment that were customarily employed as accessories in larger Palladian structures. The building is of brick



General View of Main or West Front



CENTRAL PORTION OF WEST FRONT SHOWING BASEMENT ENTRANCE

VILLA CERATO AT MONTECCHIO PRECALCINO, ITALY

Attributed to Andrea Palladio

jacketed with stucco and painted a light yellow, which is now very much faded and weather-stained. All the details are fashioned in stucco save the balustrades in the loggia openings, the architrave, frieze and pediment of the doorway, and the sills and architraves of the front windows, which are of stone and, for the most part, delicately wrought. The balusters on the low projections beneath the front windows of the main floor are painted on the plaster, and within the loggia are the half-obliterated remains of frescoes and painted pilasters, fluted and topped with Corinthian caps.

"I approve," wrote Palladio, "that in the lowest part of the fabric, which I make somewhat underground, may be disposed the cellars, the magazines for wood, pantries, kitchens, servants' halls, wash-houses, ovens, and such like things necessary for daily use. From which disposition follow two conveniences, the one, that the upper part remains all free; and the other, no less important, is that the said upper apartments are wholesomer to live in, the floor being at a distance from the damps of the ground; besides, as it rises, it is more agreeable to be looked at, and to look out of." Agreeably to this dictum, all the sundry domestic offices of the Villa Cerato are contained in the basement which, however, is light and airy enough not to cause any serious apprehension on the score of "the damps."

Through the whole depth of the main floor there runs a broad hall, a doorway at the opposite end from the entrance giving on a balcony at the rear, while rooms open out from each side, as will be seen upon examining the plan which has been arranged according to the usual scheme of Palladian design. At either side of this large hall are two lofty and spacious apartments, those upon the front being the larger. Between the two rooms upon the right are two tiny *gabinetti*—possibly intended for sleeping closets—a passage, and a small, insignificant stair leading down to the domestic office in the basement and up to the attic story. The ceilings of the hall and of the other rooms are beamed and painted.

The obvious insignificance of the stair seems attributable to the purpose for which the attic story is said, in this instance, to have been designed—a granary and storage place, and not for occupancy by members of the household. The Palladian dictum that "the staircases will be commendable if they are clear, ample and commodious to ascend, inviting, as it were, people to go up," was plainly disregarded in this instance, and there is not any of that degree of seemliness which it was the Palladian habit to accord even to staircases that were not meant to figure as conspicuous features in the architectural composition.

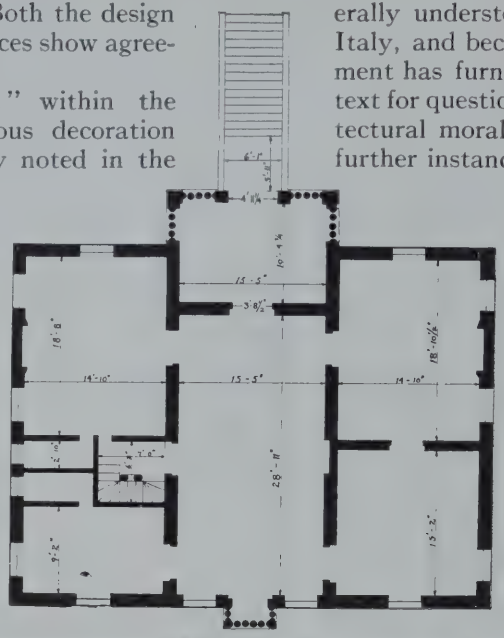
The fireplaces in the two front rooms are of an unusual and striking design that cannot fail to elicit interest. The fact that the chimney-jamb assumes a bulbous form, which narrows and recedes upward until it is absorbed in the wall surface, yields a certain degree of decorative function in the contour and, indeed, almost precludes the possibility of further applying any appropriate ornament. The painting of the walls and of the stone fireplaces is, of course, a modern defacement, perpetrated since the villa has been tenanted by two



Stucco Detail and Painted Architecture on Main Front

or three *contadini* families. Both the design and the execution of the fireplaces show agreeable delicacy and restraint.

The "painted architecture" within the loggia is a much less ambitious decoration of the sort we have already noted in the loggia and in the *sala* of the Villa Emo at Fanzolo, executed by Paolo Veronese and "Messer Battista Venetiano," and shown in THE FORUM for January. The "painted architecture" of the Villa Cerato, both in loggia and the balusters indicated beneath the front windows of the main floor, is almost obliterated, but it deserves to be noticed because its presence involves a principle that is not generally understood or appreciated outside of Italy, and because this method of embellishment has furnished hostile critics with a pretext for questioning Italian sincerity and architectural morals. As we shall frequently meet further instances of this same thing, the moral significance may as well be dealt with now, even at the risk of giving the subject relatively undue importance so far as the amount of painting in the Villa Cerato is concerned.



Main Floor Plan

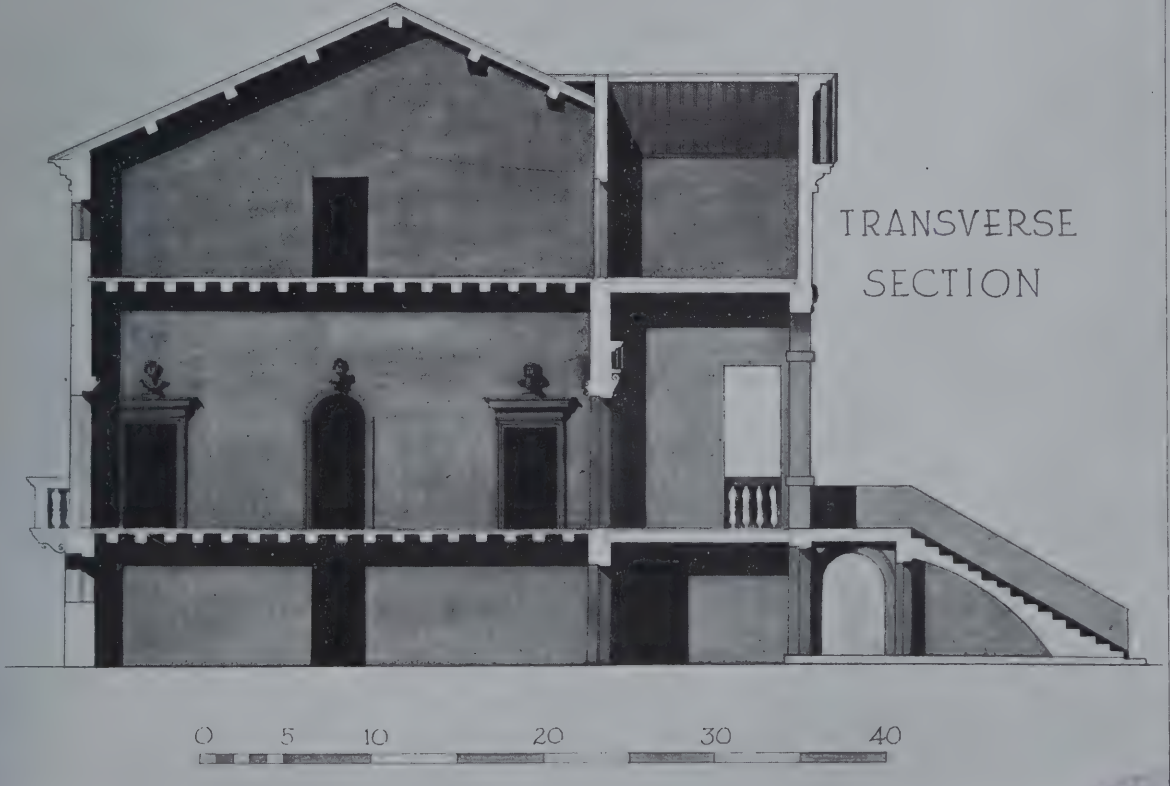


Balcony on Rear or East Front

Few, it is true, at this late day would subscribe without reservation to Mr. Ruskin's fulminations against the "foul torrent of the renaissance" or agree with him that renaissance architecture "is base, unnatural, unfruitful, unenjoyable and impious." Nor would they listen with much patience or sympathy to his rhetorical invective when he prophesies that "whatever has any connection with the five orders, or with any one of the orders; whatever is Doric, or Ionic, or Corinthian, or composite, or in any way Grecised or Romanised; whatever betrays the smallest respect for Vitruvian laws or conformity with Palladian work—that we are to endure no more." Nevertheless, there are those —and they are far more numerous than one might at first imagine—who profess admiration for Palladian work in the aggregate, pride themselves upon a discriminating taste in the niceties of Palladianism, and are given to practicing Palladian principles, but who take occasion to carp at certain practices of the Palladian age because they have inherited — perhaps without knowing it — something of Ruskin's mental bias. Into their canons of criticism they inject an "ethical" element and evince an animus against this, that, or the other particular practice which they stigmatize as "immoral" and attack it with a bitterness



MAIN ELEVATION



VILLA CERATO AT MONTECCHIO PRECALCINO, ITALY

MEASURED DRAWINGS BY ROBERT B. C. M. CARRÈRE

that savors of theological rancor. "Painted architecture" is one of the favorite objects of this *odium theologicum*. Having introduced moral judgment and moral values, they proceed to brand "painted architecture" as deception and falsity, when no deception was intended or even thought of.

It takes two parties to create a deception—the deceiver and the deceived—as Geoffrey Scott puts it, in his stimulating "Architecture of Humanism":

"The harmfulness of deceit lies, it must be supposed, either as a quality in the will of the deceiver or in the damage inflicted by the deceit. If, in discharge of a debt, a man were to give me instead of a sovereign a gilded farthing, he would fail, no doubt, of his promise, which was to give me the value of twenty shillings. To deceive me was essential to his plan and the desire to do so implied in his attempt. But if, when I have lent him nothing, he were to give me a gilt farthing because I wanted something bright, and because he could not afford the sovereign and must give me the bright farthing or nothing bright at all, then, though the coin might be a false sovereign, there is evidently neither evil nor injury. There is no failure of promise because no promise has been made. There is a false coin which, incidentally, may 'deceive' me; but there is no damage and no implied determination to deceive, because what I required in this case was not a sovereign but the visible effect of a sovereign, and that he proposed to give—and gave."



Hallway on Main Floor



Fireplace in Northwest Room

Probably no man is persuaded into believing that the false window of a renaissance front is real, and the more familiar he is with renaissance architecture the less likely is he to believe it; but neither does he wish to believe it, nor does it matter if, by chance, he is persuaded. The window is wanted for the sake of the balance it can give to the design. Deceit is absent because the facts are patent and easy to discover. "Ruskin was not more disappointed than Palladio that the palaces of Vicenza are of stucco." Few generations were more fully aware of the valuable qualities of rich material, but the architects of that period set values "in the scale of their importance, and when economic or other barriers stood in their way, preferred at least, and foremost, to indicate *design*." This brave impressionism satisfied the eye, and if the mind was deluded at all, it was merrily and only for a moment.

An ingenuous spectator who finds so much naively devised for his delight

DOORWAY TO HALL FROM ENTRANCE LOGGIA

PAINTED ARCHITECTURE ON WALL OF ENTRANCE LOGGIA

VILLA CERATO AT MONTECCHIO PRECALCINO, ITALY

will no more complain of all these "substitutes—these false perspectives and painted shadows"—than grow indignant because, in the Greek cornice, he is shown false eggs and darts. Imitation runs through art; when we have imitated in one way long enough, our convention is accepted as such. The egg and dart moulding is a convention.

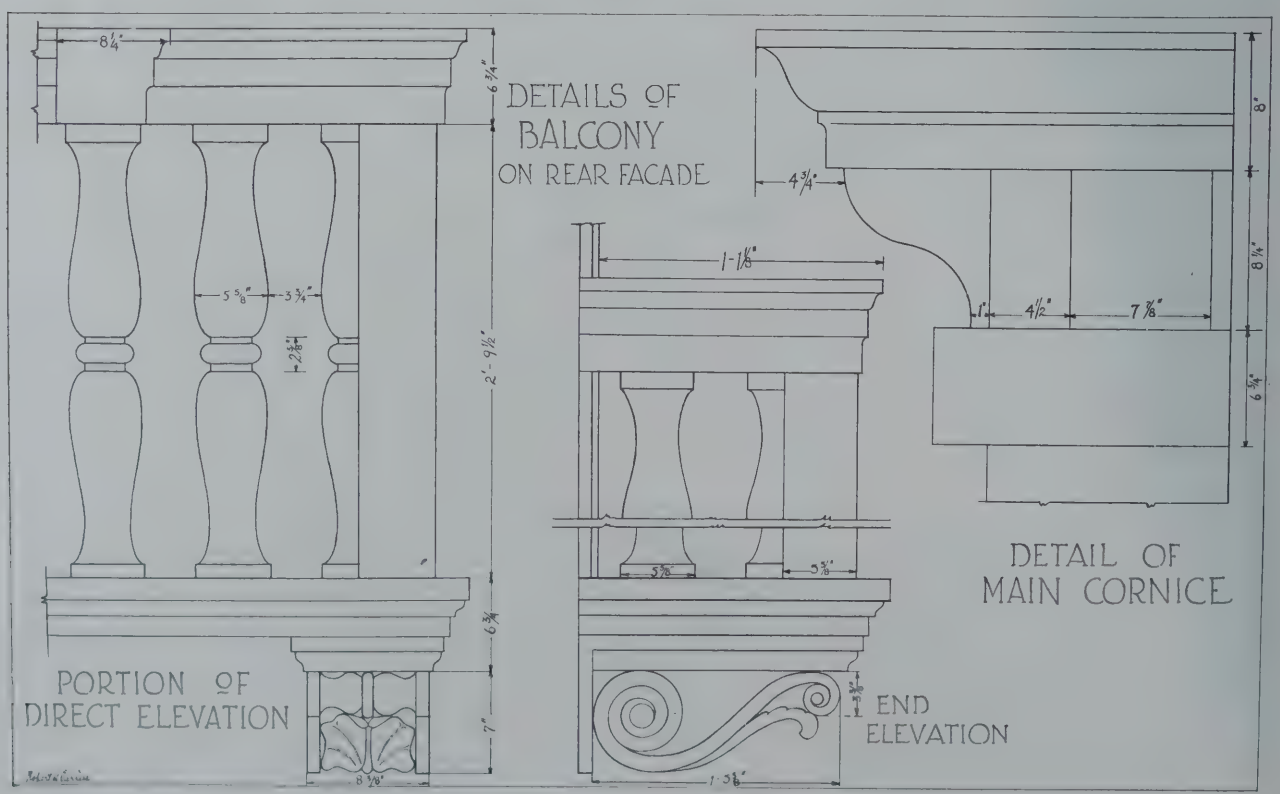
All of this applies directly to the case in point. The pleasant architectural features and adjuncts that conditions made it impossible to realize in the round, the architects of the period contented themselves with indicating in the flat—executed in paint. When they could not have the palpable, three-dimensional reality, in lieu of it they grasped the two-dimensional substitute.

In other words, "painted architecture," and the accompaniments that often went with it, are to be reckoned a conventional amenity that ministered to a sense of composition and to the imagination, often as an earnest of the architect's intentions unfulfilled and, for various reasons, unfulfillable. The fact of its existence deceived nobody. Whether we like it or not is a matter of taste, not morals. As such, our countenance or our disapproval must rest on the score of taste, not on the score of morality. Furthermore, the metamorphosis from three to two dimensions places the subject of contention in the realm of decoration and virtually removes it from that of architecture, in its strictest interpretation, so that it is manifestly inappropriate to apply to it strict architectural standards. And the fact remains, from whatever angle we choose to view it, that the "painted architecture" in the loggia of the Villa Cerato affords an element of interest and concrete imaginative suggestion; without it the loggia would have been dull and barren.

There is no documentary proof that the Villa Cerato is the work of Palladio. If not, it is nevertheless unquestionably the work of a careful adherent of his school. But the presumptive evidence in favor of its being Palladio's own work is strong. It is known that Palladio was working in the immediate neighborhood and designed a small house for Count Schio at Montecchio, between which and the Villa Cerato there is a marked similarity, although the points of difference are quite sufficient to give each its own strongly individual character.

In alluding to the lack of documentary proof of its being Palladio's personal work, Scamozzi points out that in going from the *sala* "to the stairs, one passes through an arched door without impost which does not seem . . . in the taste of Palladio." Nevertheless, "struck by the air of grandeur which shews in all its parts, and which one always observes in the buildings of our Architect," he adds that "the simplicity of this *palazzino*, along with its elegance, and its commodious internal arrangement, make it so admired of the connoisseurs that many of them without hesitation regard it as one of the many products of Palladio." To this attribution his own personal belief inclined him.

If the villa be really one of Palladio's own compositions, as seems more than likely, it is interesting to note in the lintel and arch treatment of the loggia an approximation to the so-called Palladian motif—which Palladio did not originate, and which he employed only rarely.



Impressions of the Colonial Architecture of Mexico

PART II

By WALTER H. KILHAM

THE size and architectural importance of the secular buildings erected by the Spaniards during the colonial period come as a surprise to most Americans.

These palaces are not unworthy to rank in many ways with corresponding buildings in Toledo or Burgos. They generally consist of two lofty stories, the walls being faced with the pink and porous lava scum known as *tezontle* and trimmed with a hard but well-textured light gray stone which around the main doorways is carved in intricate and imposing detail. The window trim of the second stories is continued to the cornice, enclosing a sort of transom panel which becomes a typically Mexican motif and in the cases of palaces of the high nobility the parapet is surmounted by heraldic turrets which proclaim the rank of the master. Projecting spouts throw the roof water clear of the walls, and here and there an almost forgotten Captain general has availed himself of the privilege of his rank and carved them in the form of a cannon, sometimes complete with wheels and trunnions. The great portal with its amazingly carved wooden door opens into the patio which is surrounded by imposing stone arcades which lead to a magnificent stone stairway at the rear. The skill of the ancient masons is attested by the remarkable *tour de force* in the patio of the building now used as the National School of Medicine in Mexico City where the corner pillars of the lower arcade are entirely omitted, the upper gallery being carried by stone arches concealed in the groining. Another skillful piece of masonry is the self-supporting stone stairway in one of the courts of the National Palace, which if it stood in Spain or Italy would long since have been measured and published a dozen times over.



Ancient Shrine, Mexico City

Mention should be made, though the subject deserves a longer discussion, of the curious and frequently beautiful stucco decoration in diaper patterns of the outside walls of many of the older buildings, possibly a survival from the Aztec, but more probably of Moorish origin. This work survives in many of the older houses, but in the more costly palaces it was superseded by the *tezontle* facing which became very popular.

The broad causeways which lead southerly across the level valley from Mexico City reach the foothills of the Ajusco range after ten or twelve miles. The seeker for architectural interest as well as local color will find the walk along the old highroad which skirts the base of the hills from San Angel through Coyoacan and Churubusco to Xochimilco a continual delight as it winds between groves of towering cypress and eucalyptus which overtop the long perspectives of time stained walls, and through the shady plazas of ancient villages full of one-story villas overgrown with yellow roses and purple bougainvillea. Past these antique mansions and over this same road where the patient little donkeys trudge with their pack loads of raw hides, maize or brushwood, once fled the disorganized troops of Santa Anna and Valencia before the terrible artillery of Scott and Pillow.

In the nearby convent of San Pablo of Churubusco, where massive rose and yellow belfry now looks out over the peaceful cornfields and pleasant village gardens, General Rincon made his desperate but ineffectual stand. It is



Convent of San Pablo, Churubusco

related that the white haired old General, watching the struggle from the bell tower, had his professional admiration so aroused by the splendid way in which the American troops carried the *tete de pont* a short distance away that, forgetting the desperate plight of his own men, he waved his cap and actually cheered the invaders—a truly story book example of Latin chivalry. Here at Coyoacan is a fine example of the Mexican idea of a "village" church—many domed, solid and eternal. From its roof you can look into the dark, glossy foliage of old walled gardens, watered by gurgling rivulets and across flat roofs where very likely you will spy somewhere a houseboy imitating a bull fight



Corner Treatment of a Spanish Palace



The Lower Steps at Guadalupe Hidalgo

with a red table cloth, to the snowy Popocatepetl or the frowning Ajusco. Or, if one follows the northern causeway out of the great square of the city, one comes in three miles to Guadalupe Hidalgo, the scene of a miraculous apparition of the Virgin, the resort of thousands of pious Indian pilgrims from all over Mexico who at any and all times turn



Patio in School of Medicine, Mexico City



A Street in San Angel

its streets into a panorama of color that would be the despair of any opera producer in the world. Here is the finest jewel of colonial architecture, the *Capilla del Pocito*, the Chapel of the Little Well, with its elliptical pink walls and blue and white domes, its windows blazing in brilliant detail like military decorations, and faced across the little



The Market Place at Guadalupe Hidalgo

square by blue and yellow *pulquerias* at the base of the famous steps of Tepeyac. The great church of Guadalupe, *La Colegiata*, is a real masterpiece for any country, with a fine interior, which even the unfortunate frescoes cannot quite spoil, and a highly impressive array of towers and domes, although the genuine silver railings of the altar and balconies probably carry a more direct message to the unsophisticated devotees.

"In liquid syllables the cries
Of far fruit vendors faintly rise;
And under thick palmetto shades,
And down cool covered colonnades,
The tides of traffic gently flow,
In Mexico."

One will look in vain for any important vestiges of Aztec influence on the more important examples of Mexican architecture; in fact the imported signs of Moorish influence in Spain are by far more numerous. The spiral terminations of parapets and sometimes of water tables must recall the serpent like carvings of the native work, and here and there a detail of window or finial dimly suggests an Aztec origin, but in general Spain was contented, in Mexico at least, to bring to the new country "her cross and her sorrows" and, rather than adapt the native architecture to her uses, was content to utilize the existing types of the already beautiful and dignified



Doorway of the "Capilla del Pocito"



"Capilla del Pocito" (Chapel of the Little Well) at Guadalupe Hidalgo

Spanish renaissance of Leon and Castile.

An account of Mexican architecture would not be complete without mention of the celebrated sculptor and architect, Manuel Tolsa, who after achieving high distinction in Madrid sailed for Mexico in 1791. His most important work, the vast pile of the *Mineria* or School of Mines, is a good and simple design, but began soon after its erection to crack and sink into the oozy subsoil which underlies the entire city. A more successful, and in some ways more remarkable, work is his great equestrian statue of Carlos IV, known locally as the "Iron Horse," which weighs 30 tons and was cast in one piece in Mexico in 1802, long before anything of the sort had been attempted in the United States. This statue, which stands at the junction of three important avenues, is really fine work, judged by any standard, and is appreciated by the Mexicans who, as good republicans and in order that no mistake be made, have added to the inscription the words, "Mexico preserves it as a work of art." Tolsa is an important architectural asset in the art gossip of Mexico, and any particularly good minor object of art, from a candlestick to a centerpiece, is generally credited to him.

The stormy history of the Mexican republic since its independence has prevented, except during the administration of Presi-

dent Diaz, and perhaps that of Maximilian, as much important work being carried out as would otherwise have been the case. Under the brilliant sway of Don Porfirio, however, a good many very important buildings were begun and some were finished, which may perhaps form the subject of a later article. From the earliest times, however, the treacherous subsoil under the capital, the old bed of the partially drained lakes of the valley of Mexico, has proved a stumbling block in the way of all building operations. All the ancient buildings which were not built on the original islands have settled to a considerable extent, in some cases even as much as two meters, which results in some amusing effects which can scarcely be equaled elsewhere. It is a local saying that the principal downtown theater of Mexico City stands on top of two others which have disappeared from view, while the unfinished National Theater, which was designed to be approached by an imposing flight of steps, has settled from six to eight feet so that a sort of sunken garden will have to be devised for its main entrance at the time of completion.

In case these papers have so fired the imagination of any architectural confrere as to make him want to seize his water color box and three-legged stool and start for the Rio Grande, I will add that a train leaves the frontier every day, that the people are courteous and entertaining, the oranges and *frijoles* are perfect, and *cerveza* (beer) of excellent make is at once available, not to mention more fiery and less wholesome beverages. Terry's Guide, made in the exact image of Baedeker, is invaluable, but Flandrau's "*Viva Mexico*" should be read and re-read for its inimitable local color. The delicious memoirs of the sprightly Madame Calderon de la Barca (what an asset she must have been to any country!), written in 1839–40, are exactly as fresh now as when first put on paper. Perhaps I cannot better terminate this article than by a liberal quotation from one of her letters:

"If anyone wishes to try the effect of strong contrast, let him come direct from the United States to this country; but it is in the villages especially that the contrast is most striking. Traveling in New England, for example, we arrive at a small and flourishing village. We see four new churches, proclaiming four different sects; religion suited to all customers. These wooden churches or meeting houses are all new, all painted white, or perhaps a bright red. Hard by is a tavern with a green paling, as clean and as new as the churches, and there are also various smart stores and neat dwelling houses; all new, all wooden, all clean, and all ornamented with slight Grecian pillars. The whole has a cheerful, trim, and flourishing aspect. Houses, churches, stores, and taverns, all are of a piece. They are suited to the present emergency, whatever that may be, though they will never make fine ruins. Everything proclaims prosperity, equality, consistency; the past forgotten, the present all in all, and the future taking care of itself. No delicate attentions to posterity, who can never pay its debts. No beggars. If a man has even a hole in his coat, he must be lately from the Emerald Isle.

"Transport yourself in imagination from this New England village to that of . . . . it matters not which, not far from Mexico. 'Look on this picture, and on that. The Indian huts, with their half-naked inmates, and little gardens full of flowers; the huts themselves either built of clay or the half-ruined *beaux restes* of some stone building. At a little distance a *hacienda*, like a deserted palace, built of solid masonry, with its inner patio surrounded by thick stone pillars, with great walls and



"La Colegiata" at Guadalupe Hidalgo

iron-barred windows that might stand a siege. Here a ruined arch and cross, so solidly built that one cannot but wonder how the stones ever crumbled away. There, rising in the midst of old, faithful looking trees, the church, gray and ancient, but strong as if designed for eternity; with its saints and virgins, and martyrs and relics, its gold and silver and precious stones, whose value would buy up all the spare lots in the New England village; the *lepero*, with scarce a rag to cover him, kneeling on the marble pavement. Leave the enclosure of the church; observe the stone wall that bounds the road for more than a mile; the fruit trees overtopping it, high though it be, with their loaded branches. This is the convent orchard. And that great Gothic pile of buildings, that stands in hoary majesty, surmounted by the lofty mountains, whose cloud-enveloped summits, tinged by the evening sun, rise behind it; what could so noble a building be but the monastery, perhaps of the Carmelites, because of its exceeding rich garden, and well chosen site, for they, of all monks, are richest in this world's goods. Also we may see the reverend old prior riding slowly from under the arched gate up the village lanes, the Indians coming from their huts to do him lowly reverence as he passes. Here, everything reminds us of the past; of the conquering Spaniards, who seemed to build for eternity; impressing each work with their own solid, grave, and religious character; of the triumphs of Catholicism; and of the Indians when Cortez first startled them from their repose, and stood before them like the fulfillment of a half-forgotten prophecy. It is in the present that seems like a dream, a pale reflection of the past. All is decaying and growing fainter and men seem trusting to some unknown future which they may never see. One government has been abandoned, and there is none in its place. One revolution follows another, yet the remedy is not found. Let them beware lest, half a century later, they be awakened from their delusion, and find the cathedral turned into a meeting house, and all painted white; the railing melted down; the silver transformed into dollars; the Virgin's jewels sold to the highest bidder; the floor washed (which would do it no harm), and round the whole, a nice new wooden paling, freshly done in green—and all this performed by some of the artists from the wide-awake republic farther north."

Let us hope, however, that the day is far distant when the skyscraper and the "5 and 10," not to mention the soda fountain and the armchair lunch, invade these quiet old streets, and that the work of the Mexican builders may long remain as an example, inspiration and delight to the northern "artists" who may find their way across the Rio Grande in search of things pictorial.



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Old Church at Churubusco

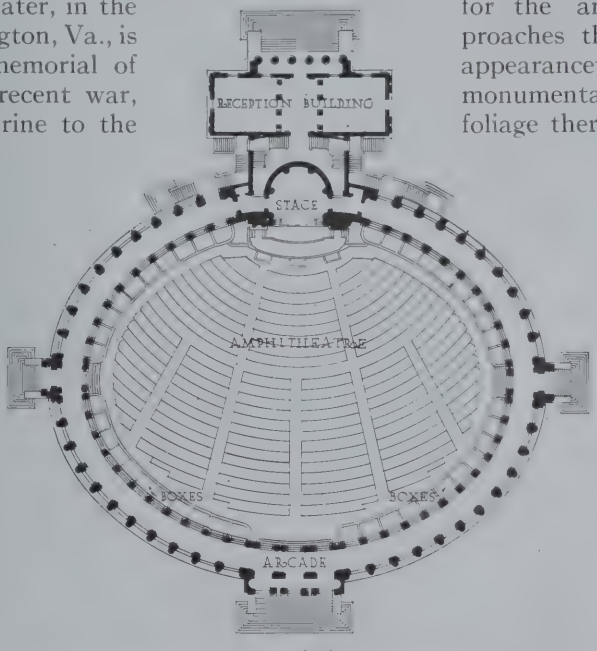
The Arlington Memorial Amphitheater

A TRIBUTE TO AMERICAN SOLDIERS AND SAILORS IN THE NATIONAL CEMETERY

CARRÈRE & HASTINGS, ARCHITECTS

THE discussion of war memorials for commemoration by state or nation of those who fell in the world war has not thus far produced much which would indicate the form which such memorials may be expected to take, or the tendency of popular taste in work of such a nature. Such monuments as have already been instituted are chiefly of a private or local character which would give but little indication of what might be expected of a memorial of a very much broader nature.

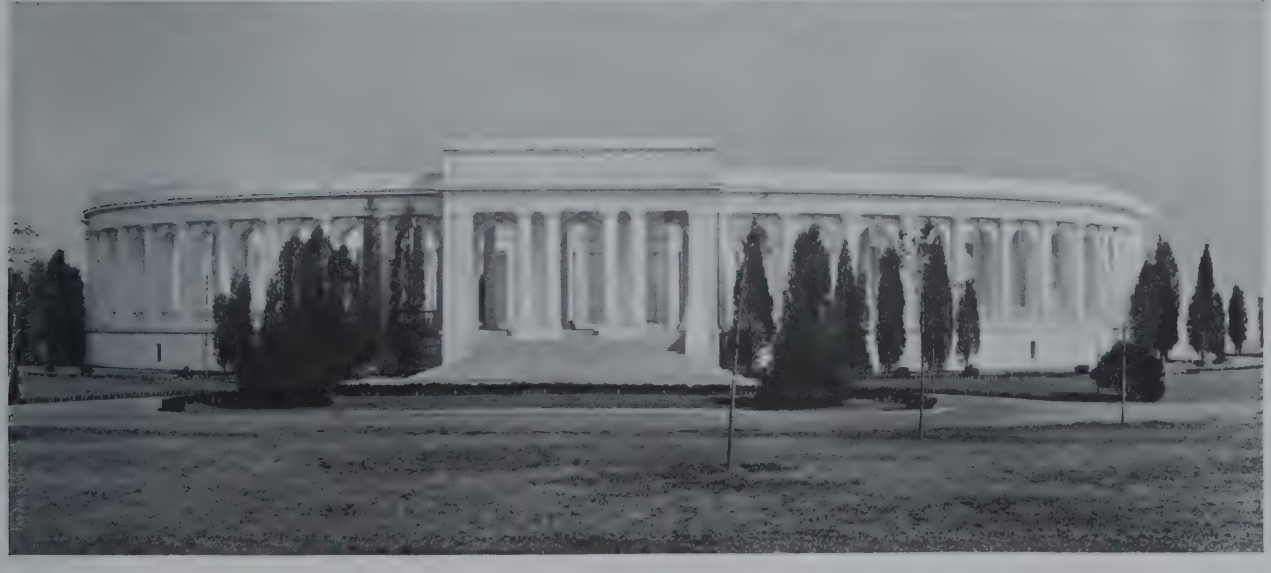
The Memorial Amphitheater, in the National Cemetery at Arlington, Va., is something more than a memorial of those who fought in the recent war, being rather a national shrine to the memory of all Americans, whether soldiers or sailors, who have fallen in the various wars in which the United States has been engaged. This memorial, as is fitting, has been placed in the cemetery which possibly more than any other one spot is associated with the memory of the nation's sons who, whether on land or sea, have died in its defense. The monument has taken the form of a great amphitheater in which gatherings of an appropriate patriotic or commemorative nature may be held, together with such accessory buildings and other adjuncts as the use of such an amphitheater would naturally involve.



General Plan

The memorial has been given an excellent setting not far from the Maine monument and is approached from the Potomac River by a wide roadway which divides immediately in front of the building and surmounts the terrace which forms a base for the amphitheater. As one approaches the memorial it presents an appearance which is impressive and monumental. Against a background of foliage there stands the retaining wall of the terrace and just above appears the reception pavilion with its classical portico at the sides of which appear the columns and arches which surround the amphitheater proper and which are united at the opposite side by a monumental entrance from which leads a flight of marble steps.

Within the entrance portico is a sculptured frieze showing trophies of war and other symbols. The interior of



Arcade and Amphitheater Entrance Opposite Stage

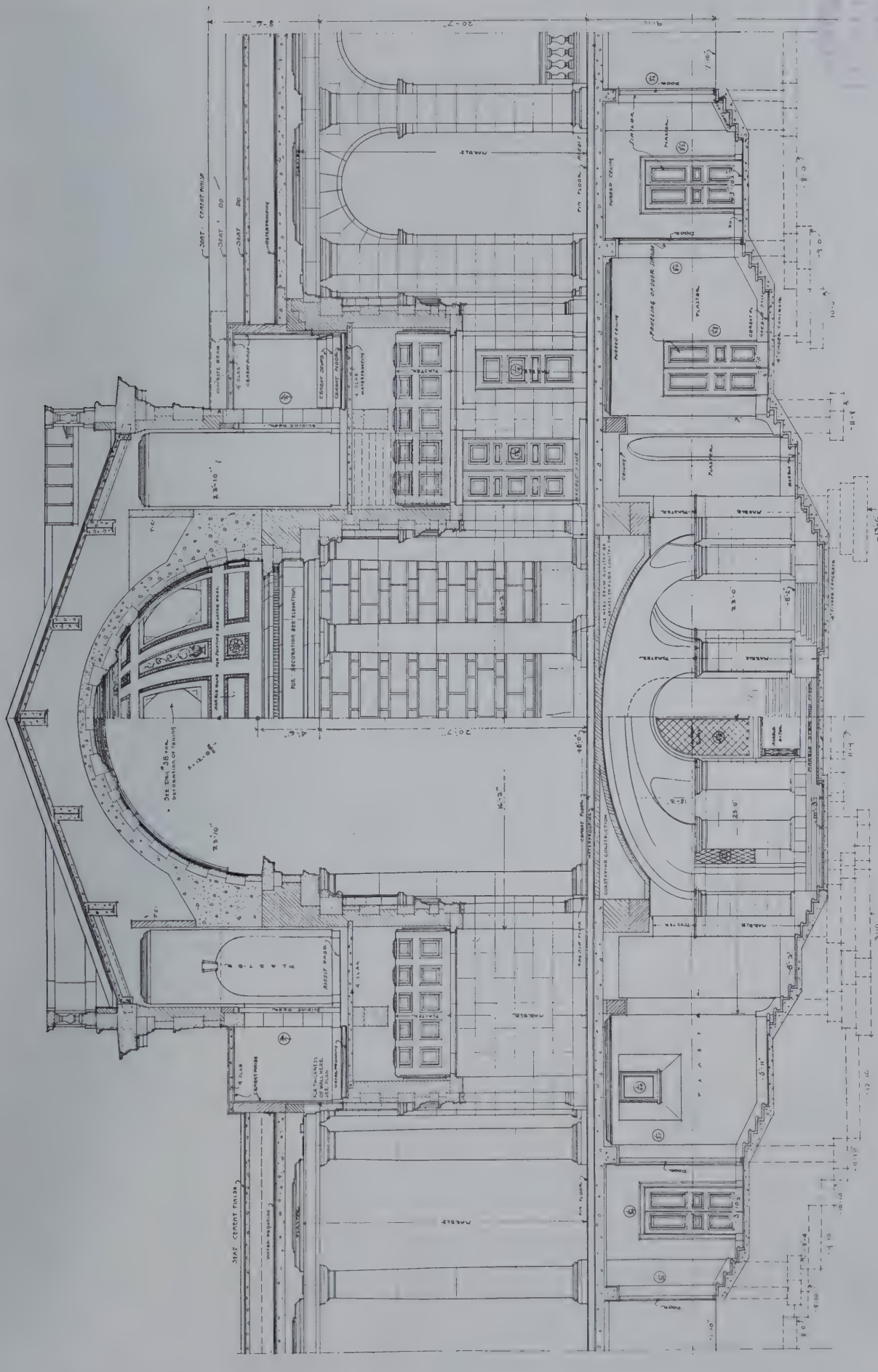


DETAIL OF FRONT OPPOSITE STAGE

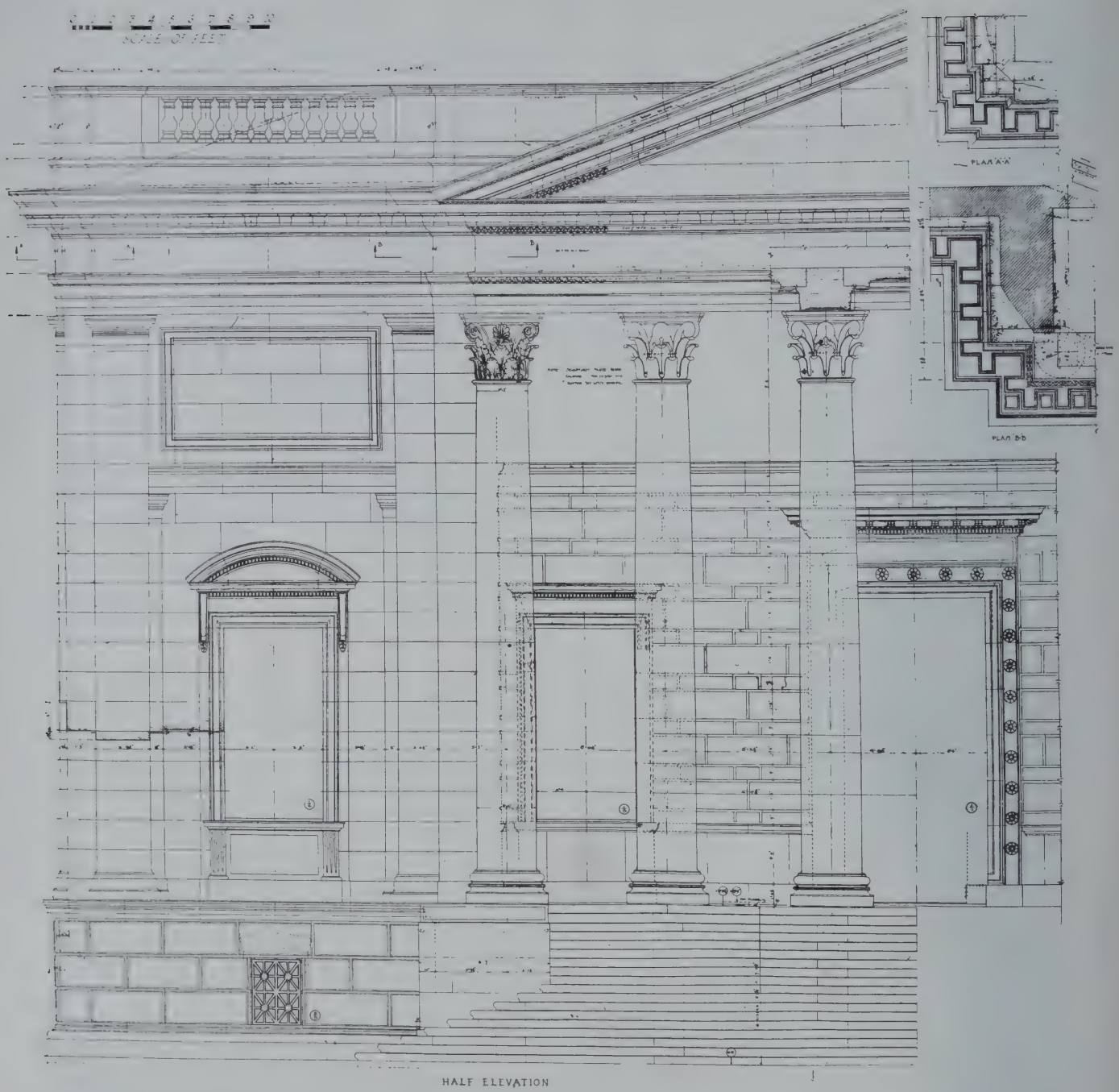


JUNCTION OF ARCADE AT STAGE

THE ARLINGTON MEMORIAL AMPHITHEATER, ARLINGTON, VA.



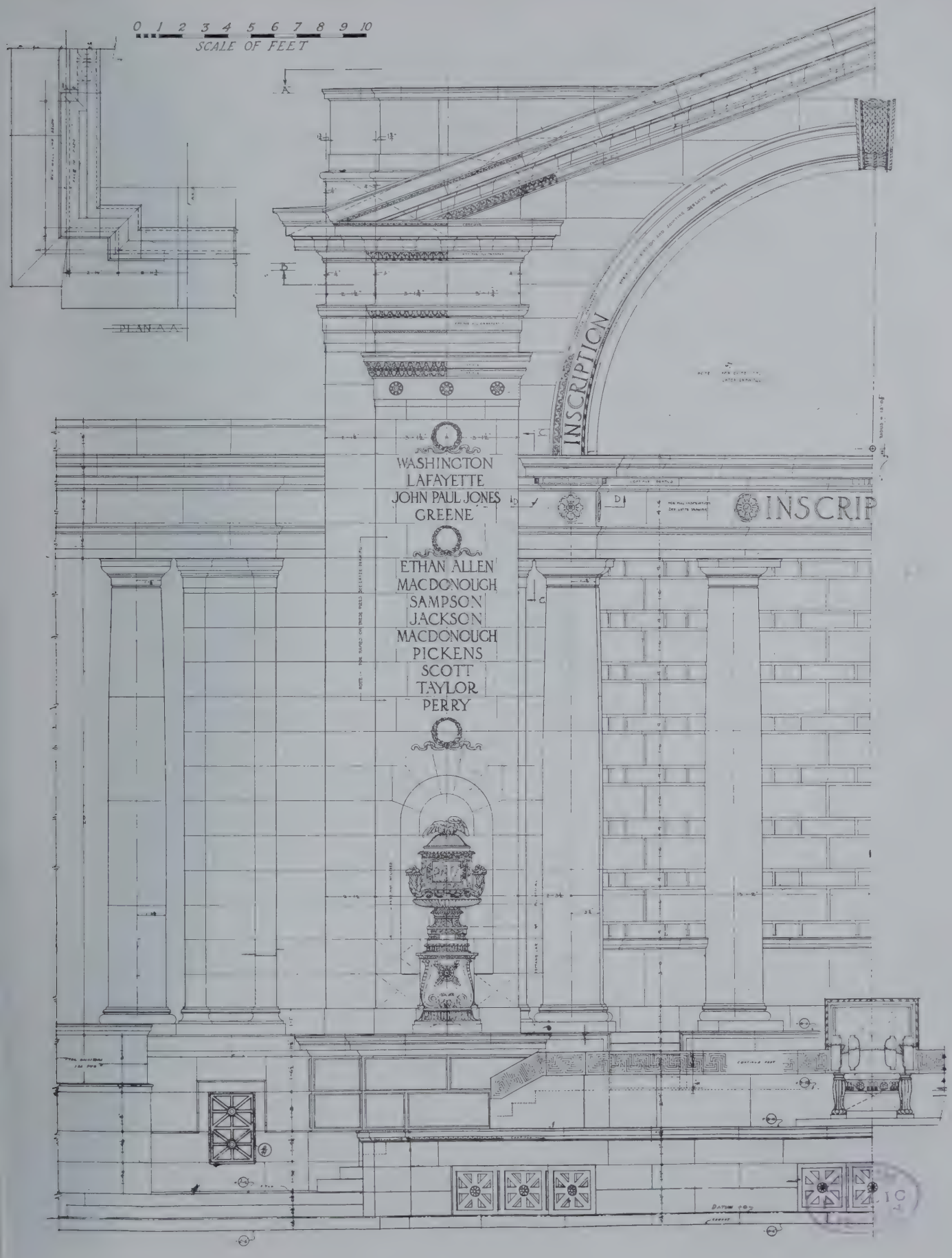
SECTION THROUGH CHAPEL AND STAGE ON AXIS OF ARCADE, ARLINGTON MEMORIAL AMPHITHEATER, ARLINGTON, VA.
CARRERE & HASTINGS, ARCHITECTS



Half Elevation of Main Facade of Reception Building

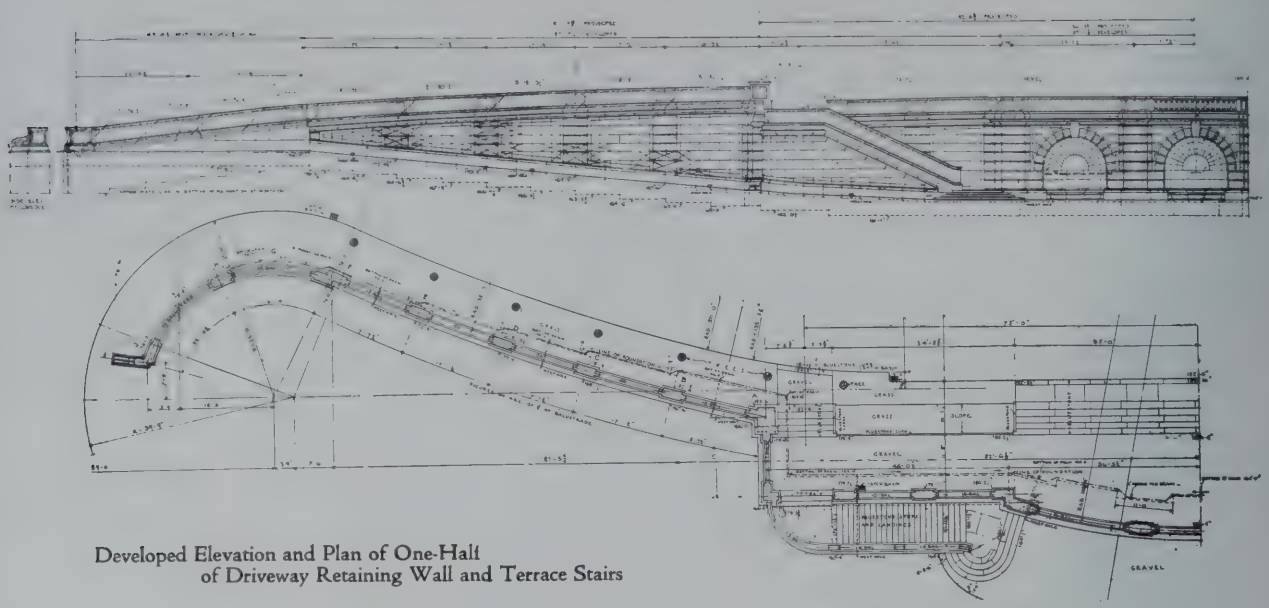
the reception pavilion is a great room faced with white marble and with a gallery at either side supported upon marble columns. This reception hall, or gallery, is intended to serve as a place for the entertainment of distinguished visitors upon suitable occasions and for the exhibition of battle flags, portraits and other trophies and relics. Since it may be necessary at times to use the reception hall for gatherings of a somewhat different nature provision has been made for serving luncheons and the necessary kitchens and service rooms are installed. Just beyond are corridors and stairways leading to the stage of the amphitheater proper. The stage is semi-circular in form and is covered with a half-dome roof which is richly carved. On either side are piers upon which are inscribed the names of eminent warriors. Appropriate inscriptions are cut upon the frieze around the stage and also upon the arch facing the amphitheater. The stage is built upon three levels and will seat almost 100 people. Beneath the stage is a mortuary chapel with a domed ceiling and raised ambulatory. It is intended that this chapel shall be sometimes used for funerals or commemorative services when the number of people attending is not large, and it has been arranged to seat 150.

The arcade which is a striking feature of the memorial as seen from the approach encircles the amphitheater which is elliptical in form. Marble benches will seat 4,000 and in the boxes within the



HALF ELEVATION OF STAGE, ARLINGTON MEMORIAL AMPHITHEATER, ARLINGTON, VA.

CARRÈRE & HASTINGS, ARCHITECTS



Developed Elevation and Plan of One-Half
of Driveway Retaining Wall and Terrace Stairs

bays of the arcade 500 more may be seated; the arcade also allows standing room for about 1,000 so that some 5,500 people in all may be accommodated at one time. Beneath this encircling arcade there are 300 crypts in which are to be placed the remains of the nation's distinguished soldiers and sailors. In front of each crypt and in the pavement of the arcade directly above will be inscribed the names of those buried there. Upon the outer cornice of the arcade there are 44 panels in each of which is inscribed the name of some important battle in which the army or navy of the United States has been engaged, beginning with the early battles of the revolutionary war and including the most important engagements of the war just ended.

In the construction of the Memorial Amphitheater care has been exercised in selecting the best qualities of materials and making use of the most approved methods of building. Foundations throughout have been laid of concrete and brick with steel used as reinforcement, and steel has also been employed in building the floors and roof of the reception pavilion. The retaining wall, which faces the Potomac River and which extends across the main front of the memorial, is faced with granite from the Fox Island quarries and the exterior of the building proper and the encircling arcade or colonnade is built of marble from the quarries at Danby, Vt., carefully selected for its whiteness and even texture. For interior construction considerable use has been made of Botticino marble in floors, columns and cornices and in certain other instances.

Particular care and thought have been given to the designing of appropriate details of metal wherever they occur in the form of grilles, lighting fittings and other accessories. An amphitheater, open to the weather and built almost wholly of marble, demands careful consideration of the resulting problems of drainage and an examination of the plans will show the provision of adequate drains in every part of the structure. Across each of the aisles there are several metal gratings covering drains, and other drains are provided for every four or five rows of benches in the amphitheater.



General View from the Approach



DETAIL OF SIDE ENTRANCE

MEMORIAL AMPHITHEATER, ARLINGTON, VA.

CARRÈRE & HASTINGS, ARCHITECTS



ENTRANCE TO RECEPTION PAVILION

MEMORIAL AMPHITHEATER, ARLINGTON, VA.

CARRÈRE & HASTINGS, ARCHITECTS

DETAIL OF STAGE

MEMORIAL AMPHITHEATER, ARLINGTON, VA.

CARRÈRE & HASTINGS, ARCHITECTS

INTERIOR OF RECEPTION HALL AND DOORWAY ON STAGE

MEMORIAL AMPHITHEATER, ARLINGTON, VA.

CARRÈRE & HASTINGS, ARCHITECTS



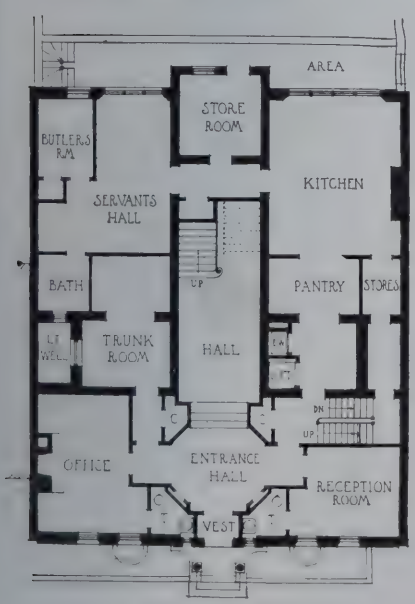
FRONT VIEW

HOUSE OF EX-PRESIDENT WOODROW WILSON, WASHINGTON, D. C.

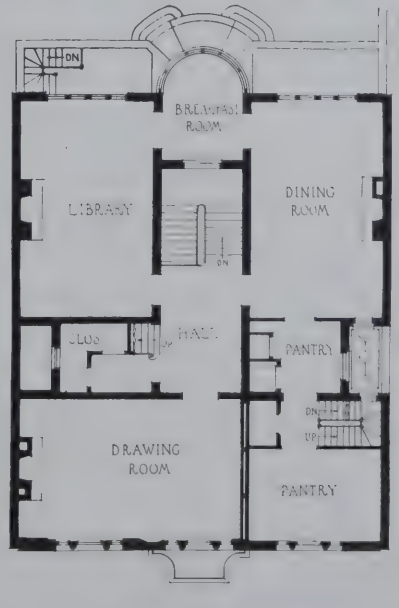
WADDY B. WOOD, ARCHITECT



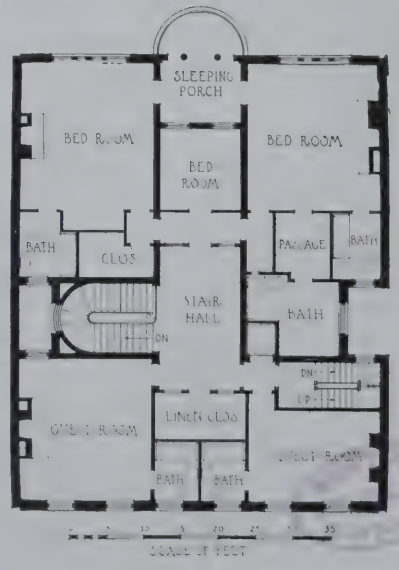
GARDEN VIEW



BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF EX-PRESIDENT WOODROW WILSON, WASHINGTON, D. C.

WADDY B. WOOD, ARCHITECT



DRAWING ROOM



MANTEL IN LIBRARY

HOUSE OF EX-PRESIDENT WOODROW WILSON, WASHINGTON, D. C.

WADDY B. WOOD, ARCHITECT



TOWER FROM STREET



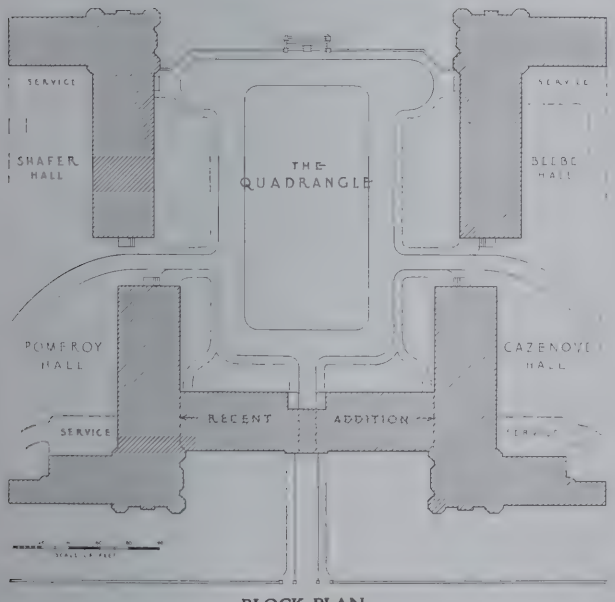
TOWER FROM QUADRANGLE

ADDITION TO DORMITORY QUADRANGLE, WELLESLEY COLLEGE, WELLESLEY, MASS.

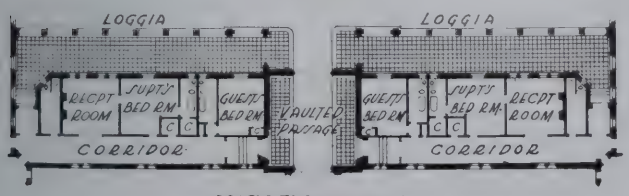
J. A. SCHWEINFURTH, ARCHITECT.



GENERAL VIEW FROM COURT



BLOCK PLAN



MAIN FLOOR PLAN



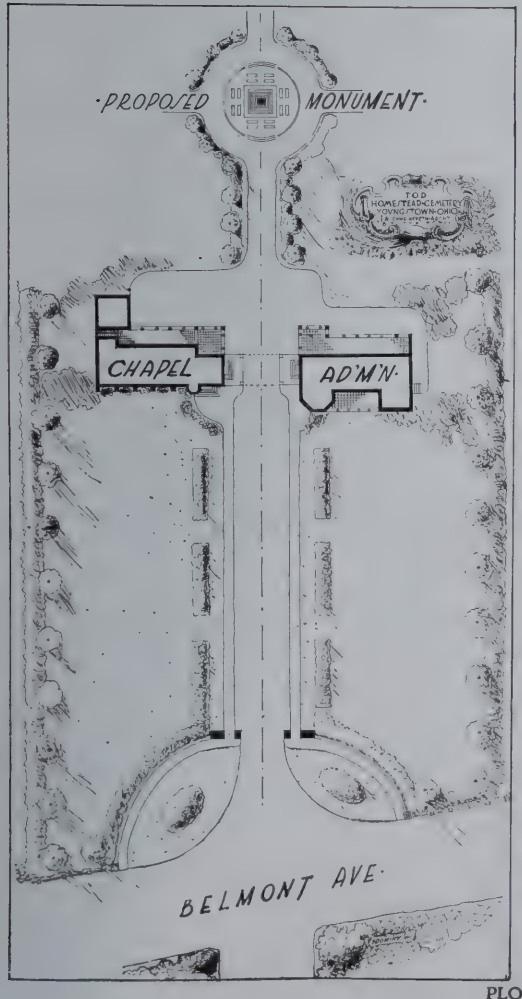
COURT ARCADE

ADDITION TO DORMITORY QUADRANGLE, WELLESLEY COLLEGE, WELLESLEY, MASS.

J. A. SCHWEINFURTH, ARCHITECT



GENERAL VIEW FROM APPROACH





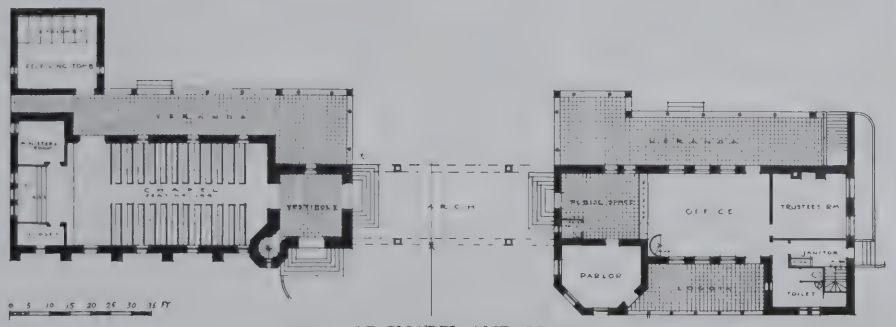
PLOT PLAN AND TOWER DETAIL

GATE AND CHAPEL, TOD HOMESTEAD CEMETERY, YOUNGSTOWN, OHIO

J. A. SCHWEINFURTH, ARCHITECT



GENERAL VIEW OF INTERIOR



PLAN OF CHAPEL AND OFFICE



DETAIL OF CHANCEL

GATE AND CHAPEL, TOD HOMESTEAD CEMETERY, YOUNGSTOWN, OHIO

J. A. SCHWEINFURTH, ARCHITECT

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Terra Cotta Roofing Tile

PART II

By ALFRED LO CASCIO

FREQUENTLY in looking at houses with tile roofs we see indications of settlement and sagging in different parts, more especially around dormer windows. This opens up the flashing at points where water and snow can easily get in and cause damage to walls and ceilings. To obviate this difficulty it is quite essential to see that the frame for the roofing is properly arranged. This is true in materials other than tile, such as slate, and in this connection it may be well to suggest to architects that the roofing construction should be sufficiently tied across, with additional studs, braces, etc., so that the minimum depth of the rafters may be used, and still leave no opportunity for difficulties caused by sagging or settlement.

The Spanish tile weigh 950 pounds per square or 9½ pounds per square foot.

French (interlocking) tile weigh 925 pounds per square or 9¼ pounds per square foot.

Interlocking shingle tile weigh 900 pounds or 9 pounds per square foot.

6 x 12 x 3/8 shingle tile weigh 1150 pounds per square or 11½ pounds per square foot.

6 x 12 x 5/8 shingle tile weigh 1725 pounds per square or 17¼ pounds per square foot.

The Roman pan and roll tile weigh 1100 pounds per square or 11 pounds per square foot.

The straight barrel mission (half cylinder or concave and convex tiles) weigh 1200 pounds per square or 12 pounds per square foot.

For comparison with these figures the weights of slate roofing may be noted. The ordinary slates weigh 650 pounds (a little under 3/16-inch size), the 3/16-inch weigh about 750 pounds and the ¼-inch about 850, 3/8-inch about 950 pounds, ½-inch about 1000 pounds and 1-inch 1500 pounds per square. Any slates more than 1-inch thick, such as graduated and special thicknesses, are from 1500 to 1900 pounds per square. It is evident, therefore, that the weight of standard tiles as compared with the weight of the ordinary slates requires no special framing whatever and that the proper framing for slate is absolutely sufficient for tile, which is contrary to the general impression.

The usual rafter sizes to carry terra cotta tile are 2 x 7 or 2 x 8, 16 to 18 inches on centers. These sizes are used in almost all residential work and in a great many other buildings for the standard tiles. Of course for the extra heavy slab or graduated tile heavier rafters would be needed, which is also true for extra heavy or graduated slate.

The sheathing used over the rafters need not be tongue and grooved, as long as the boards are fairly even and laid closely, although the tongue and grooved sheathing makes a better job. The usual thickness of the sheathing is from 7/8-inch to 1-inch and it is not good construction to use cheap sheathing, uneven, irregular and with knot-holes, because difficulties may soon arise in connection with improper nailing. There must be something substantial to receive and hold the nails fastening

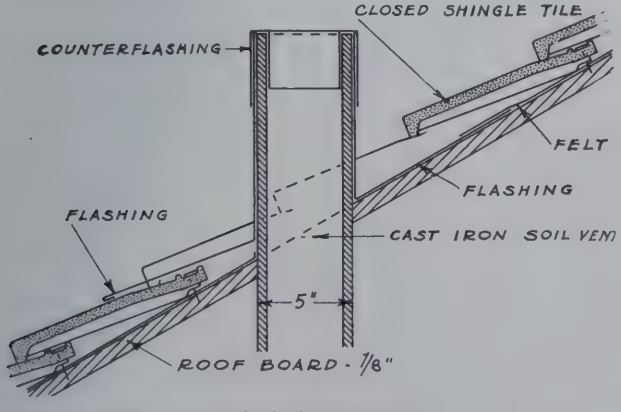


Fig. 10. Method of Flashing around Vent

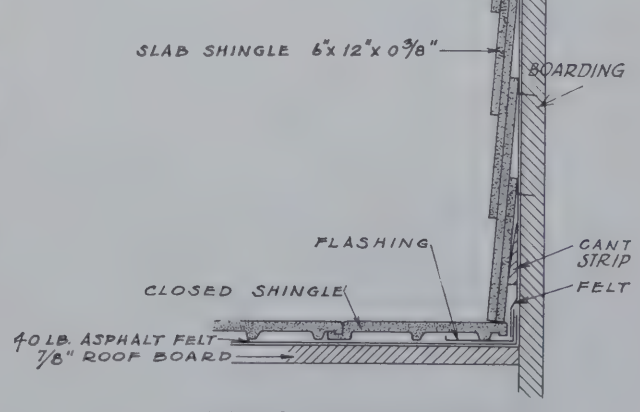


Fig. 11. Flashing for Perpendicular Slab Shingle

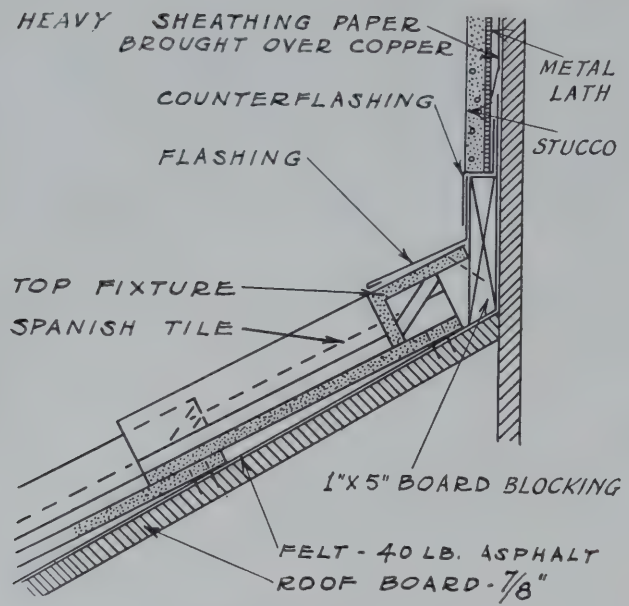


Fig. 12. Flashing Pitched Roof to Vertical Wall

the tile, and surely a knot-hole or wide spacing in the sheathing is not the right foundation.

It is not the purpose of this article to enter into a discussion of carpenter phases of tile work, but there are a few suggestions which are really important. The custom seems to prevail at the present time of having dormer studs run by headers and spiked through, instead of being halved on as in the earlier days. The result of this method of construction is that the weight of the tiles in the dormers is indirectly transferred to the nails and is carried only by them. This is obviously unfair in any type of construction, but more so where permanency is one of the chief assets, and in connection with roofs of first class construction it is important to see that the frame of the roof is not so constructed.

It has been found in the cases of large apartment houses that book tile may be laid, carried by light angles, over which is a layer of concrete, which has a characteristic of holding the nails securely. There are many types of material on the market at the present time answering this description.

Many real estate owners have found it to their advantage to eliminate altogether tar and gravel for roofing surfaces of certain structures, such as office buildings. Particularly is this true in large corporation buildings and department stores where the roofs serve the purpose of an exercise yard for the employes. In such cases it would be well to use flat quarry tile or a special flat shingle tile which can be bedded either in concrete or mastic or joints run in tar.

One point which frequently causes trouble is flashing around steam pipes, vent pipes, etc. which penetrate the roof surfaces. Fig. 10 shows a method of preparing this flashing and while it is indicated for a sloping roof with a board finish, the same

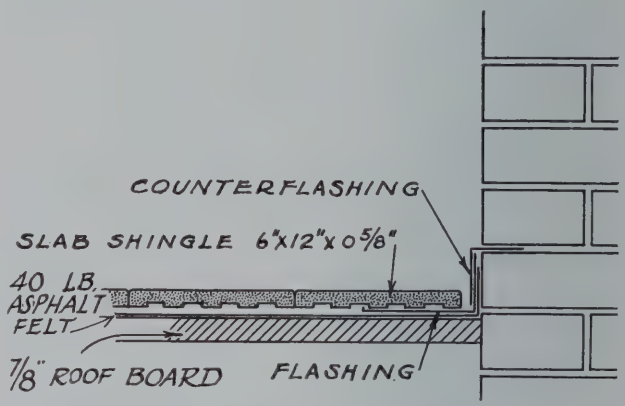


Fig. 14. Flashing Shingle Tile against Brick Wall

general details would apply for flashing an all fireproof construction and also for all flat surfaces. It should be noticed that the apron flashing over the tile is carried up against the vents and it is essential that a copper flashing be placed over this and carried down. For this method, in place of the usual stock plumber's pipe showing a 10- or 12-ounce 10 x 12 copper flashing, it is better to use not less than 20 x 24 16-ounce soft roll copper or lead flash-

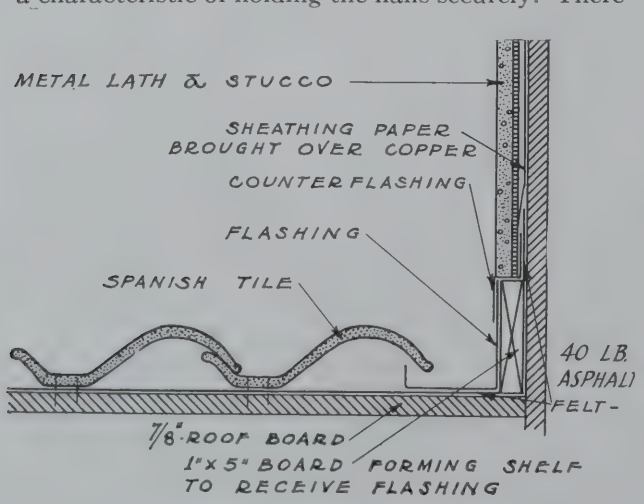


Fig. 13. Method of Flashing against Stucco Wall

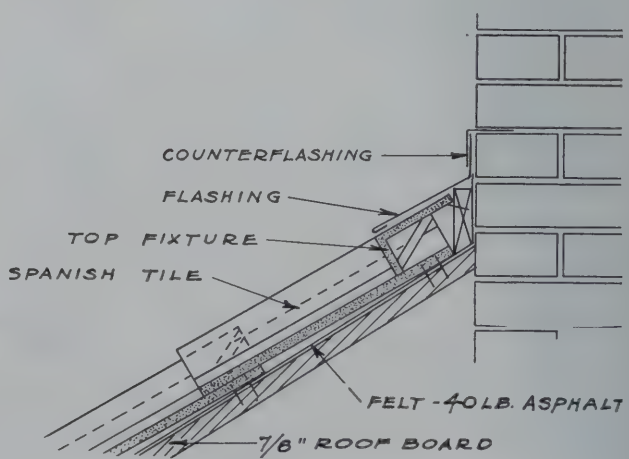


Fig. 15. Metal Apron in Brick Wall for Pitch Roof

ing. Lead is sometimes used to greater advantage in connection with a roll tile, as it is easier to mould around the tile than the copper. This, however, is not always true when flat shingle tile is used.

In a previous article the problem of flashing against the sides of dormer windows or vertical walls was taken up. Figs. 11, 12 and 13 show the accepted methods of flashing under these conditions.

Relative to this method of flashing there is a very simple but rather important process which is often neglected, that is the placing of roofing paper against the vertical wall before the wire lath and stucco are placed. This paper should come over on top of the counter flashing, so that if water should find its way through the stucco it would follow the lines of the paper over the flashing, whereas, if the flashing were placed against the paper, the water would naturally run down in back of the cant strip, causing a leak. Where the roof comes in contact with surfaces of different characters, expansion and contraction from heat and cold of the materials used must be carefully considered. In this connection counter-flashing and

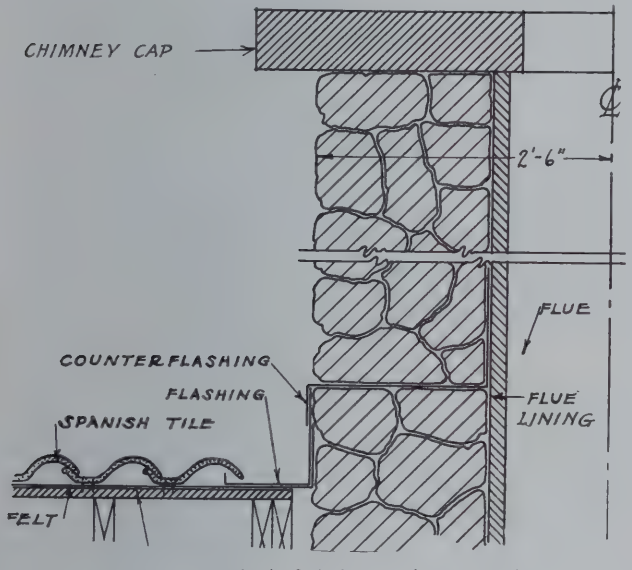


Fig. 16. Method of Flashing with Stonework

under-flashing should always, to secure the best results, be followed by double flashing. Figs. 14, 15 and 16 illustrate methods of flashing which will take care of expansion and contraction.

Fig. 16 also shows the construction of a chimney out of field stone, which is a very treacherous material with which to work. The counter-flashing should be carried through the stone and up against the flue lining and turned up in back of the stone, the remainder of the work being done in the usual way. If this arrangement is not carefully followed out, nine times out of ten the chimney will leak. Another point, which is frequently somewhat neglected, is the forming of the drip pan or flashing under dormer window sills. This is difficult when the flashing comes very close to the sills. Fig. 17

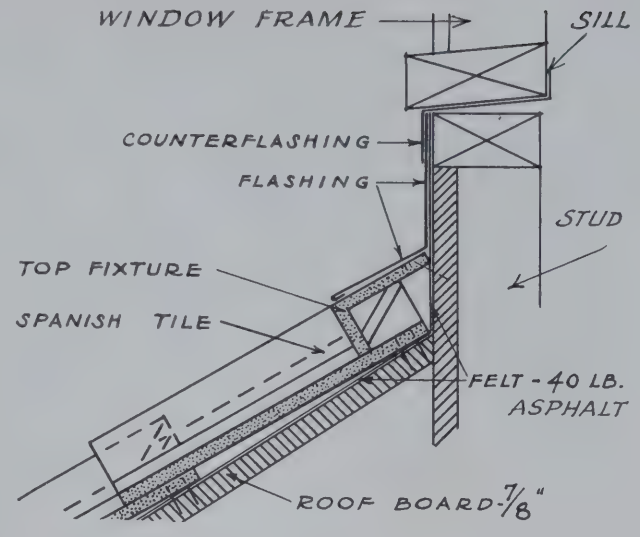


Fig. 17. Method of Flashing Dormer Window

shows a method which has proved its merit in keeping water out from dormer windows where the sills are too close to the roof. Counter-flashing should be carried across and turned up at the ends of the sills.

In connection with tile roofs, the question of handling water at the eaves of the sloping surfaces is one which has caused considerable annoyance. A remedy for this is the construction indicated in Fig. 18, which has a gutter suspended in such a manner that a heavy rush of snow or ice will pass over the top of the gutter. The strap of the gutter should be

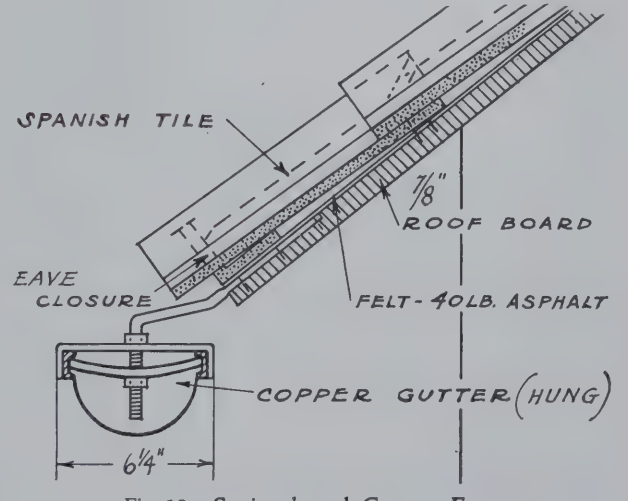


Fig. 18. Section through Gutter at Eaves

countersunk, flush with the roof board under the roofing paper. It is most essential to place gutters in such positions that they will receive the water from the roof in heavy rains or light rains, and special care should be taken to adjust the gutters to the conditions on each building. Some tile roofs require cant strips which are formed on tile-like eaves closures, which raise the valley or pan of the tile and great care should be taken in regard to the proper location of the gutter.

Truss Design and Details

PART V. THE SCISSORS TRUSS

By CHARLES L. SHEDD, C.E.

IN some buildings, especially churches, a form of wooden truss known as the scissors truss is frequently used. Figs. 19 and 20 show two forms of this truss. The heavy lines show compression members and the light lines show tension members.

The form shown in Fig. 19 is the more common. In this truss all members are made of wood except the small vertical in the center which is of metal,

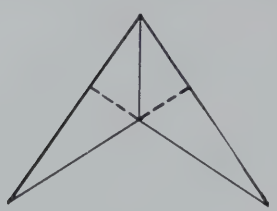


Fig. 19

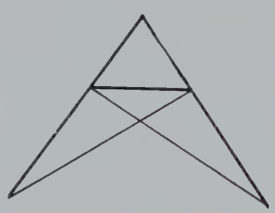


Fig. 20

usually a rod. Plates have to be used at the joints to develop the members. The detail of these joints is often rather difficult to design properly. When the only load on the truss is at the ridge, the members shown dotted have no stress to carry.

The form shown in Fig. 20 is made entirely of wood except the plates at the joints. If there were no shrinkage in the wood and if the joints were perfectly made it would act like any ordinary truss and have no thrust at the supports except that due to the wind and secondary stresses. In practice, however, there is more or less thrust developed at the ends, especially some time after the truss is built. If the truss is carried on the top of a wooden post or on the top of a high, thin wall serious trouble may develop a year or so after the building is erected. This trouble appears in a spreading of the walls and leaks in the roof. Such a condition may reflect on the reputation of the designer al-

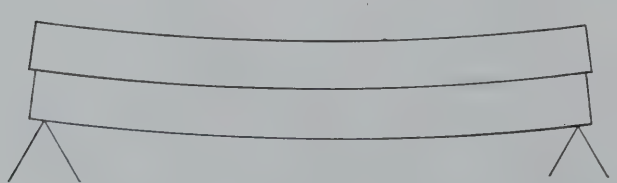


Fig. 21

though he may feel that he had designed the structure properly. He should therefore be careful not to use such a truss except where there are abutments in the walls of sufficient strength to resist any possible thrust which may come on them.

There is no doubt but that plenty of church roofs may be found with this type of truss and no provision made for thrust where the building has proved entirely satisfactory. However, the fact that one structure designed in a certain way has proved all right does not necessarily prove that every structure designed in this way will prove satisfactory. If, when reasonable care has been taken by the builder and the inspector, trouble occurs at times in a certain type of design, it is unsafe for the designer who values his reputation to repeat this type without taking proper precautions to guard against the trouble appearing in his structure. In other words, the designer should try to make his design "fool proof."

If one of these structures loosens in the joints there will also occur considerable bending in the wooden members due to what are commonly known as secondary stresses. This makes another point to guard against in the designing of this type of truss.

Deepened Beams

A previous article in THE FORUM described a common method of reinforcing a wooden beam known as the king post truss and the queen post truss. There are two other well known methods. One of these is formed by placing two beams on

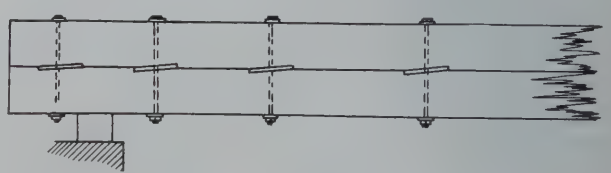


Fig. 22

top of each other. If they are placed in this way, but not fastened together, they will deflect into a form such as is shown in Fig. 21. Here it will be noticed that at the surface between the two beams they slip on each other. (Notice the positions of the ends.) In this case they will have a strength equal to the combined strength of the two beams which would be the same as if they were placed side by side. If, however, they are fastened together sufficiently so that they cannot slip when loaded they will have a much greater strength. If the sticks are of the same size the developed strength of the two sticks, fastened securely together, will be four times as great as one stick alone.

The first method which might occur to the designer for fastening these sticks would be to bolt

them together with vertical bolts passing through both sticks. This however will seldom, if ever, develop the maximum strength although it would add considerably to that of the timbers if used with no connection. The reason for this is that the bolts will bend and crush into the wood before the full strength of the sticks is developed.

It is therefore common practice to put keys between the two beams and then bolt them together as shown in Fig. 22. These keys may be made of wood, preferably of some hard wood such as oak, or of cast iron, wrought iron or steel. Those shown in Fig. 22 would be of steel or wrought iron. Oak blocks would be larger, with the sides parallel to the sticks instead of inclined. See Fig. 28. Cast iron keys are often cast in irregular shapes. In any case it is important that these keys be longer than they are thick. The thickness of the key is determined primarily by the bearing required on the end of the wood fibers to prevent the slipping. This bearing stress causes a twisting moment on the key which must be resisted by bearing against the sides of the wood fiber in a direction at right angles to the first stress. This stress varies in intensity from zero at the middle of the key to a maximum at the end, so that, due to this and to the fact that wood cannot resist pressure against the sides of the fibers as well as on the ends, the key must be of sufficient length to distribute this stress.

The tendency to slip is less toward the middle of the span if the load on the beam is uniform. If the load is concentrated this stress is the same at any point between the support and the first concentrated load. In Fig. 22 the keys are shown spaced farther and farther apart as the distance from the support increases, as would be the case for a uniformly loaded beam.

The Flitch Beam

The other method of strengthening a wooden beam is known as the flitch beam, shown in Fig. 23. In this case two or more wooden beams are placed side by side with metal plates between them. These plates may be made of steel, wrought iron or cast iron. As the allowable stress per square inch varies considerably for various materials and as the modulus of elasticity also varies it is not correct to add the strengths of the separate parts together to get the resultant strength of the flitch beam. Such a result would often be very different from the true strength which would be developed. The principle underlying this type of design usually appears to be obscure to anyone who has not had it explained and faulty assumptions may result if it is not clearly understood.

When we speak of the modulus of elasticity we mean the relation which the stress per square inch bears to the deflection. Thus, with hard pine if a certain beam deflected an inch there would be a certain stress per square inch in compression at the top of the beam, but if that same section were made of steel and loaded until it deflected an inch the stress per square inch in the same relative position would be very much greater. The allowable stress per square inch in steel is much larger than it is for hard pine, and if the ratio between these allowable stresses were the same as the ratio between the actual stresses with the same deflection then we could add the strengths of the different parts together to obtain the strength of the whole, but unfortunately these ratios are not the same. The result would be that if we took such a beam and started putting on the load a little at a time the allowable stress in one material would be reached before it would in the other. It is therefore evident that the safe load on such a beam would be reached when one of the materials had been stressed up to its safe amount.

This form of beam is not in such common use now as it was years ago, due largely to the fact that it is not usually an economical section. When this type is employed it is not necessary to use a metal plate in the middle but an I beam or two channels may be used facing each other with a wooden beam between them. The bolts do not resist any considerable stress but hold the different parts together and make them act simultaneously if it happens that the load is at first applied to one part more than to the others.

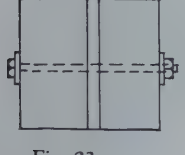


Fig. 23

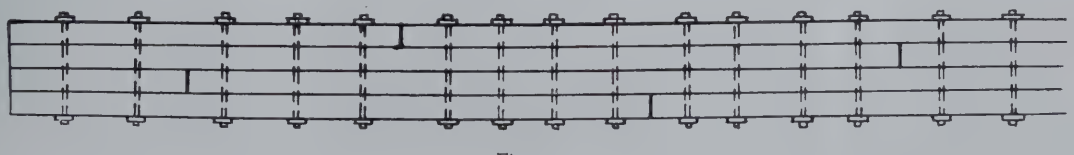


Fig. 25

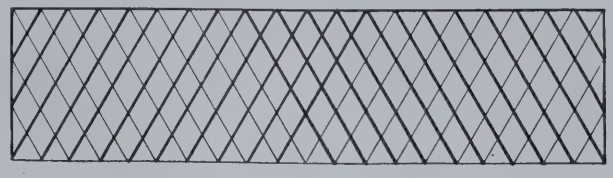


Fig. 24

Latticed Trusses

In Fig. 24 is shown a latticed truss. This is really in effect several trusses with chords in common. They are built of wood with the web members fastened to the chords by wooden pins or

bolts. It was quite common years ago to build this form of truss for bridges throughout New England and many of them are still standing on highways and railroads and are spoken of as "covered bridges." In these the web members passed between the pieces forming the chords and extended some little distance beyond them. This was to prevent the pins or bolts from shearing out at the ends of the web members. A source of weakness was often found in the end posts due to

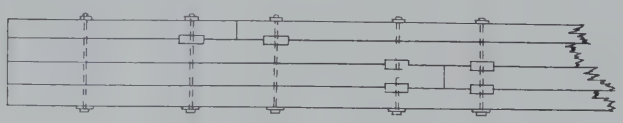


Fig. 26

bending caused by the stresses from the short web pieces which met on them. When the loads were light this form of bridge was very satisfactory. It was cheap, easily built with local labor, and any developing weakness was observed in such a wooden structure usually before it became dangerous, and could be repaired to make it safe.

During the late world war considerable notice was taken of this type of truss for roof construction. The chords could be curved or inclined and they proved to be a very satisfactory structure for a cheap, temporary building which could be erected with considerable speed and without labor of great skill. It appears to the author, however, that some architects have given undue credit to this form of truss, welcoming it as "a new type of design" and as "a type developed by the war and come to stay," all of which description appears to be an exaggeration of the true facts. The idea is not new, and therefore was not developed by the war, and the writer doubts if it has come to stay except in special construction where, after careful consideration of

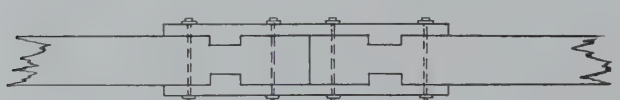


Fig. 27

the conditions and a complete understanding of the value of this type of truss, it is determined upon as the best to use. In some of these trusses which the author has noticed it has appeared to him from superficial examination that there existed a weakness in the fact that the web members were not carried a sufficient distance beyond the pins or bolts to provide against shearing out at the ends, as noted in the preliminary description of the old covered bridges.

Tension Splices

In wooden construction, especially trusses, it is at times desirable to splice a member which is subjected to tension. In our consideration of wooden trusses in previous articles it was noted that it was often cheaper to pay the extra for a longer stick than to make the splice if it were designed properly. However there are times when a splice is the proper thing to use. In trusses it is the bottom chord which may require splicing. If this chord can be made up out of several pieces, side by side, these separate pieces may sometimes be broken near the ends of the truss where the stress is not a maximum, and by staggering the breaks in the different sticks splices may be made which by the aid of bolts do not overstress the structure at any point. When it can be accomplished in this simple manner it would look something like Fig. 25.

It may here occur that the bolts are not sufficiently strong to resist the stress which they transfer, in which case we have to insert keys similar to those used in the deepened beam in which case the splices would look like Fig. 26.

These types of splice do not develop the entire strength of the sticks in any case—in fact it would be impossible to develop the full strength of any tension stick due to the loss of section from cuts or bolts. However, these splices described so far can be used to develop a small part of what the stick



Fig. 28

could carry were it in one piece and the types shown in Figs. 27 and 28 can be used to develop still more strength.

In the case of Fig. 27 a splice is shown in which the material is entirely wood with the exception of the bolts. To reduce the size of the splicing material wrought iron or steel may be used in which case the lugs may be made of separate plates riveted to the long plate by countersunk rivets. The efficiency of the splice may be increased up to a certain point by increasing the number of lugs. The greatest efficiency can be reached when the material in the stick which is left between opposite notches is a maximum. Lugs should not be used less than $\frac{3}{4}$ inch thick and one inch is still better. The distances between the lugs and from the nearest lug to the joint should be at least 12 times the thickness of the lug.

A simple splice is shown in Fig. 28 composed of four short angles connected by bolts and bolted through the wooden sticks. Especial care should be taken to make the angles thick enough to resist the bending to which they are subject. The maximum efficiency of this type of splice is quite likely to be limited by the available thickness of this angle. This could be helped somewhat by angles running along the long bolts and so stiffening this outstanding leg of the short angles. The bending on the other leg might then be the limiting feature.

An endless number of splices might be designed but these described illustrate the basic principles.

MINOR ARCHITECTURE
EXEMPLIFIED IN MODERATE COST BUILDINGS

A City House Development of Greater New York

WALTER HOPKINS AND PHILIP RESNYK, Associated Architects

THE securing of the absolute maximum in value for the "irreducible minimum" of expenditure is, in well planned homes of moderate cost, worked out to a solution so successful that the utmost in area and equipment is had at the smallest possible financial cost.

Norwood Gardens is a development in which these results have been secured to an unusual degree. The selection of the location itself denotes the practice of efficient economy for it is in a district of Queensboro actually close to Manhattan, being almost opposite East 86th street, but hitherto neglected by builders owing to the lack of transportation service necessary for its development. The opening of new transit lines has brought this district to within 15 minutes' travel of 42nd street, at a five-cent car fare. Another detail in which economy of planning is evident has been the financing of the project, in all of its aspects, by one great financial institution, the Metropolitan Life Insurance Co., which has supplied the funds for building, making possible close prices on large quantities of material bought for cash, and which also furnishes the funds required for the permanent mortgages which many of the buyers of these homes assume. The price of a house in Norwood Gardens is $15,000, of which $1,500 is payable on signing the contract, $3,500 on delivery of deed and $10,000 covered by mortgages.

Planned and built by one ownership, results have been secured which give to the development a highly distinctive character which is attractive to a discriminating class desiring city residences of artistic design and good construction, in a restricted



View of Fifteen-House Block Showing Variation of Facades



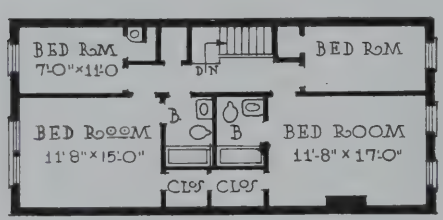
A Gabled Facade Used at Intervals in Blocks

locality and readily accessible from the business district of New York. The setting of the houses 25 feet from the street affords a clear space of 110 feet between houses on opposite sides, and 25 feet of this space on each side of the street is arranged in a continuous parked space which gives a well cared for appearance to the locality.

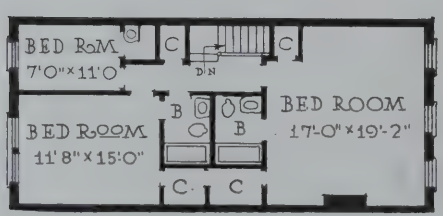
Behind these spaces, planted with grass and shrubbery, the facades of the houses appear to the greatest advantage, each with its brick-paved terrace across the front, edged around with a privet hedge. Wholly unlike the dreary brown stone fronts of an earlier day or the restless, incoherent buildings of a later period, these tasteful dwellings with their well ordered symmetry suggest homes in certain parts of London, for while the materials used are different, the effect of unified development is much the same.

The facades show a careful use of rough textured brick and cream colored stucco with roofing tiles for certain cornices and a moderate use of wrought iron and modeled terra cotta, while well selected colors for the shutters and other exterior woodwork heighten the distinguished appearance of the houses. The wide use of automobiles and constantly growing demand for garages, even in city houses, have resulted in a practical and economical solution. By giving up the ordinarily useless back yard of the city dwelling and throwing together all such areas a wide, open, paved space has been secured upon which there opens from each house a garage sufficiently large for two cars.

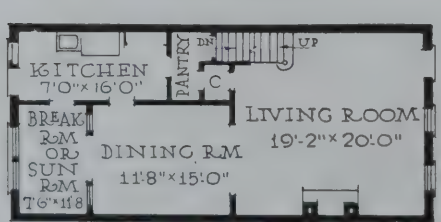
In planning the interiors of these houses there have been secured for them the sunshine, fresh air, spaciousness and the easy housekeeping features of more costly dwellings. In those houses from which the hall is omitted the entrance is directly into a living room 19 x 20, which alone covers about the area of a city apartment of two rooms and bath.



Alternative Second Floor Plan



Second Floor Plan



First Floor Plan



Typical Rear Detail Showing Basement Garage





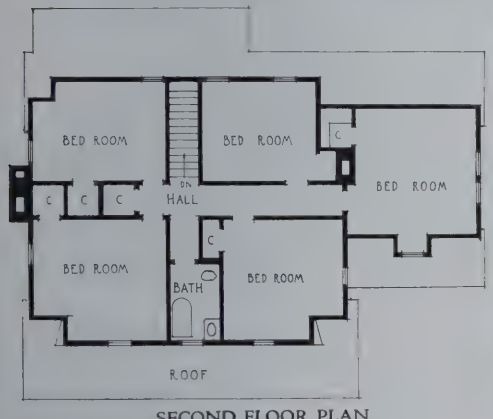
FACADE TREATMENT OF TYPICAL HOUSES

GROUP OF CITY HOUSES AT NORWOOD GARDENS, QUEENSBORO, N. Y.

WALTER HOPKINS, ARCHITECT FOR ELEVATIONS



GENERAL VIEW



SECOND FLOOR PLAN



FIRST FLOOR PLAN



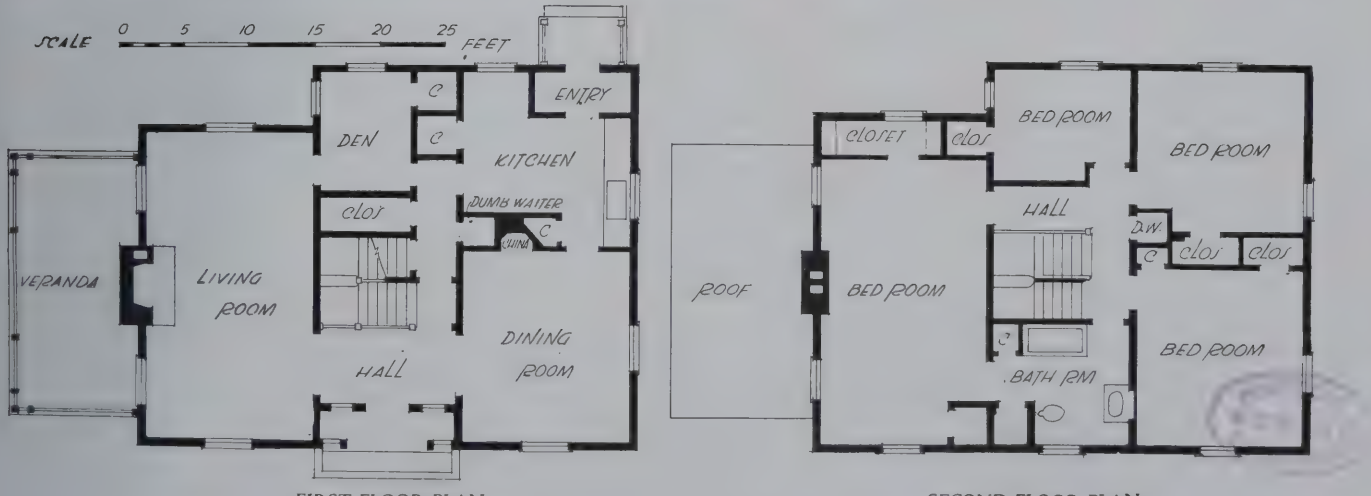
OFFICE ENTRANCE

SUPERINTENDENT'S HOUSE AND OFFICE, AMAWALK NURSERY, AMAWALK, N. Y.

JAMES C. MACKENZIE, JR., ARCHITECT



VIEW FROM STREET



FIRST FLOOR PLAN SECOND FLOOR PLAN

HOUSE OF R. W. LANGLEY, ESQ., NEW HAVEN, CONN.

C. F. TOWNSEND, ARCHITECT

DECORATION & FURNITURE
Jeanne Taylor, *Associate Editors*, Leland W. Lyon, R.A.

Interior Decoration Commissions

BUSINESS METHODS SUCCESSFULLY EMPLOYED BY ARCHITECTS

I. Utilizing the Services of a Professional Purchaser

AS explained in the January issue there are three practical methods by which an architect may handle an interior decoration commission. The application of these methods depends partly upon the intricacy and size of the project and partly upon the architect's personal inclinations. These several methods may be briefly reviewed.

1. On a complex problem it may be well to advise the employment of a skilled interior decorator, usually of the type maintaining an extensive stock of reproductions, antiques and modern decorative materials. In carrying out this method the decorator works with the architect and owner.

2. This method involves the handling of the complete transaction by the architect alone.

3. Sometimes another plan may be preferred, and this method involves the handling of the operation by the architect engaging an interior decorator as a professional purchaser to carry out details of buying, matching samples and carrying on business transactions with manufacturers and dealers.

This is the first of three brief articles which will outline the application of the various methods here described, and the subject for present consideration is the third method, by which the services of a professional purchaser are employed to carry out the details under the architect's guidance. We may first consider the business relationship to be established between the architect and the client, and between the architect and the interior decorator who is to act as professional purchaser and adviser on details. We have three elements to consider: first, the commission which the architect should receive; second, how the interior decorator is to be paid; and third, the provision of a comprehensive service which will be satisfactory to the owner.

The architect's commission under this method of operation is usually 10% of the total expenditure involved. This is paid directly by the owner and covers these various details:

Interior design and general specifications.
Obtaining of estimates through the interior decorator.
Supervising the purchases and work of the decorator.
Checking costs and generally protecting the interests of the owner.

The decorator, being essentially a contractor, is paid no fee but is allowed the trade discounts which result when the owner pays retail prices. In some instances the decorator allows cash discount percentages which vary in accordance with the transaction but which serve to reduce the cost somewhat from the owner's viewpoint. The trade discount which the decorator receives may average 25% or more, but as he (or she) has not only to carry the financing of the transaction until the owner makes payments, but has also a large amount of detail work to carry out, this is but a fair return.

The architect, in consultation with the owner, develops the general interior room schemes. The work of obtaining samples and prices on paper, fabrics, furniture, fixtures and equipment of every kind is then turned over to the professional purchaser who, having a thorough knowledge of the market, will soon assemble the necessary data so that the architect may show samples to the owner or take the owner to various shops to inspect furniture and other decorative units.

The price schedule is prepared by the professional purchaser and is checked by the architect. When approved by the owner this entire scheme is put into operation, purchasing of necessary quantities is commenced and sub-contracts are made for papering, painting, decorative tile work, interior woodwork and similar details. These contracts and purchases are approved throughout by the architect and while the carrying out of the project is followed closely by the interior decorator, supervision is also provided by the architect.

This method of handling an interior decoration project is particularly applicable to the architect's office where there is not sufficient work to maintain a regular department, and where the services of someone who knows the market may be required in order to expedite the work and to relieve the architect of the laborious details involved in obtaining samples of materials and prices on furnishings of numerous kinds. It is therefore evident that the selection of an individual competent to carry out this work is important, and if an architect has not already been in contact with someone who is capable of doing this work, it may be that information is obtainable through other architects' offices or by inquiry among members of the wholesale decoration trades.

It is interesting to note that this class of interior decorators is made up almost entirely of women, which is probably a natural development based on the feminine instinct for shopping. The relations between the architect and interior decorator of this class should be entirely open and frank, insofar as a knowledge of the discounts received by the decorator may be concerned. There should be definite co-operation to protect the interests of the owner and to avoid the natural tendency of the decorator to purchase where the most favorable discounts are allowed.

Handling the Business Details

At best the business features of a project of this nature are complex, and while it may seem that the decorator's discount is at times large, it must be noted on the other hand that on many of the items involved the discounts are so small that usually they balance to no more than a fair total payment for the time and painstaking effort required on the part of the professional purchaser. Fundamentally, both from ethical and sound business viewpoints, the architect who is paid a commission on this type of work by the owner is not entitled to receive any share in the profits of the decorator, or any special discounts which are not immediately credited to the owner's account.

In many of the letters which we have received from architects on this subject it has been said that the usual charge in handling an interior decoration commission is 10%. There have been complaints that this is not sufficient to place this part of the work on a paying basis. If the architect handles all details of a project of this kind himself, without the aid of a professional purchaser, this condition is true, for the amount of time involved in gathering details is so great that in the end the architect will have nothing more than the satisfaction of carrying out his ideas through the entire project in building and interior design. In itself this reward to the average architect is of great importance, and many firms carry out the details of furnishing and decoration for this alone. On the other hand, it is evident that the payment of a fee by the owner constitutes sound business policy, and that he receives a definite service from the architect for this payment. Accordingly, the architect who may carry out a scheme in the manner just described will avoid much of the detail work, and consequently a 10% fee will show him a profit.

It may be noted at this point also that the Furniture and Decoration Department of THE ARCHITECTURAL FORUM has now developed a service through which it is in a position to recommend professional purchasers of good standing who are willing to co-operate in every way with the architect in carrying out a project under this plan. Or, if architects located at various points which may be out of touch with the furniture and decorative material markets developed in important cities wish the co-operation of local purchasers, this can also be arranged.

The question of securing a professional purchaser who will work efficiently in the interests of the owner and harmoniously with the architect offers some difficulties. Assuming that such a relationship has not as yet been developed, the architect will seek the services of someone who has good general knowledge of this market and the ability to purchase carefully. Experience is requisite, which at least qualifies the purchaser as having accurate knowledge of fabrics and equipment and of furniture quality and styles. There are many individuals, usually women, who possess these qualifications and who are available for co-operation with the architect. Elaborating somewhat on the business features involved, it will be found that these decorators work either on their own accounts, as contractors, or directly for the account of the architect as agent for the owner.

Complex trade conditions provide issues which must be met squarely by the architect. Some furniture, decoration and equipment houses will deal directly with the architect, allowing discounts which he in turn credits to his client. Others will not deal with the architect on this basis but will allow such discounts to the decorator who retains these amounts in payment for services. Usually such discounts require payment of the bill within a limited period of time. As an instance, the case may be cited of one dealer who allows to the decorator a discount of 20% if the bill is paid in ten days. Evidently the decorator is forced to see that the bill is paid within this time—or else lose the commission. Consequently, if the decorator is not financing the project throughout (as a contractor) and collecting in turn from the owner, arrangements should be made for prompt payment.

A Typical Commission

The practical manner in which this condition may be met may be demonstrated by outlining a typical project recently handled under this plan. This project involved the complete furnishing and equipment of a new dwelling. A schedule with a few sketches was prepared by the architect, covering the house room by room. This schedule was not in detail but gave a general outline of decorative and furnishing requirements with approximate costs per room. After revision and approval by the owner, detailed requirements were given by the architect to the decorator. Material samples and furniture were assembled, one room at a time, for the owner's final approval. Actual cost tabulations were provided at the same time and upon approval of each room the owner drew a check to the architect's account as agent, covering all items. The architect was thus placed in a position to pay all bills immediately and to check against the cost figures provided by the decorator. This plan worked out to the satisfaction of all, the decorator was placed in a position to allow some cash discount to the owner and the project proceeded smoothly to completion.

Furnishing of Community Buildings with Limited Funds

THE CHESTER CLUB, CHESTER, PA.

CLARENCE WILSON BRAZER, ARCHITECT

THERE can be no doubt that several phases of war work, particularly those involving community betterment in the districts where soldiers were quartered, have contributed definitely to the development of interior decoration under limited expenditure. The ingenuity of architects and decorators was called upon for the furnishing and decoration of community buildings constructed by Y. M. C. A., War Camp Community Service, Knights of Columbus and similar organizations. As never before public interest has been developed in the subject of inexpensive club and community buildings for varied purposes—as war memorials, for industrial employes, and for purely social activities. It is but natural, therefore, that many architects will be called upon to supervise or carry out work of this nature.

A clever solution of such a problem, and one which may furnish valuable suggestions, is to be found in the recently constructed Chester Club at Chester, Pa., designed by Clarence Wilson Brazer under whose direction furnishing and decoration has been carried out. The Chester Club, while it is a private club, is to be used for various city functions, receptions and similar community activities.

Owing to the necessity of limiting the expenditure to a moderate sum the idea of using specially designed furniture was immediately eliminated. The architect made interior sketches of typical rooms, indicating the furniture requirements and drawing on information contained in the catalogs of several manufacturers and furniture makers. He then invited dealers, who carried the most suitable lines, to submit prices. After carefully checking prices, orders were placed taking into consideration not only reasonable prices but quality of workmanship and design of the stock materials and furniture. This work, therefore, represents an assemblage from the stocks of several firms but through all the rooms there has been maintained the harmony necessary with a well designed building. The colonial spirit is accentuated without the sacrifice of comfort. There is no overfurnishing, neither is there to be found the meagerness which might have resulted owing to the limitation of expenditure. The Windsor chair, which has gained much popularity for its comfort and artistic value, is used extensively throughout the club. The lighting fixtures of black iron and brass have been adapted from the designs of old lamps used in colonial days.

A successful method of handling the purchase of



The Lounge Looking toward Library



Ladies' Dining Room Adjoining Main Dining Room

furniture and decorative materials, which is often employed in connection with large projects where quantities of furniture are required, may be of interest to architects facing a similar problem. In the instance of the Chester Club sketches of rooms, together with specifications, were submitted to several firms on a contract basis in much the same manner in which an architect would begin the placing of a sub-contract in a building operation. Definite price quotations were received on the basis of the specifications and contracts placed.

One architect, who has handled many large furnishing commissions in connection with buildings which he has designed, has very successfully developed this purchasing method. If he requires 400 or 500 dining room chairs for a restaurant, he places a contract directly with the furniture factory to produce the chairs in unfinished form, a separate contract being let for finishing, painting, staining and varnishing. This architect usually selects a typical chair from stock, and sends to the factory for the shop drawings. Slight changes are then made in his office, such as the turning of the legs or arms, or the form of the chair back, and a new shop drawing is prepared to accompany the order, thus achieving a distinctive result at small increased cost over the usual stock chair.

With upholstered pieces, the order is often placed with this office for the necessary wooden framework and a separate contract is made for upholstering, the necessary covering material being furnished.

Several of the large department stores which maintain extensive furniture departments are always interested in supplying furniture and decorative materials on a contract basis.



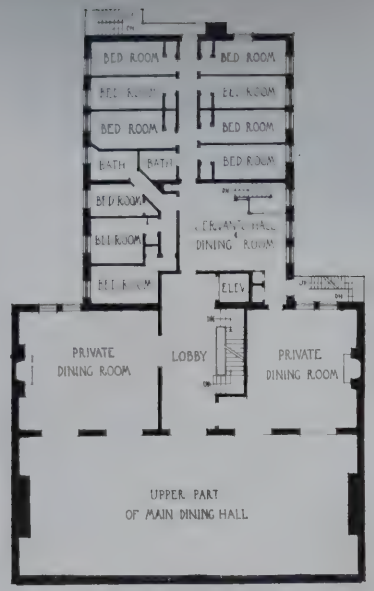
Main Dining Room on Second Floor



RECEPTION ROOM

CHESTER CLUB, CHESTER, PA.

CLARENCE W. BRAZER, ARCHITECT



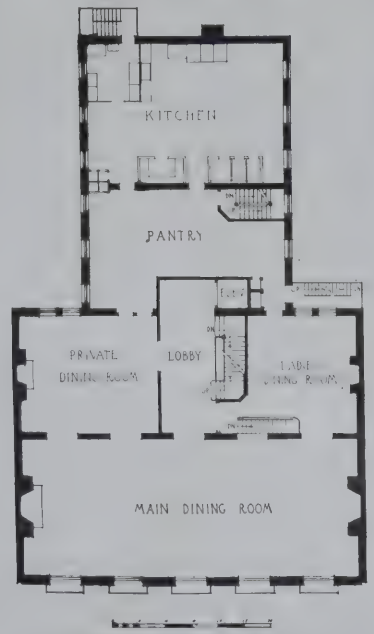
THIRD FLOOR PLAN



FOURTH FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



ENTRANCE DETAIL

CHESTER CLUB, CHESTER, PA.

CLARENCE W BRAZER, ARCHITECT

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Business Aspects of a Successful Co-operative Apartment Development

DURING the past few months there have been received in the office of THE ARCHITECTURAL FORUM a great many inquiries regarding the business methods of developing co-operative apartment house projects. A number of these inquiries have asked for definite information regarding a successful individual project of this nature.

After a careful analysis of various developments of this type we have selected that known as the Jackson Heights Development of The Queensboro Corporation as being representative of a co-operative housing project based on sound business principles. Many of the co-operative projects which have been successfully developed heretofore have been of the very expensive type involving partial occupancy by owners and the renting of the remainder of the space in the building. In the Jackson Heights Development, however, the apartments while attractive in design are moderate in cost, and consequently will be of more general interest to those who contemplate such developments in various sections of the United States and Canada.

In the January, 1919 and July, 1920 issues of THE ARCHITECTURAL FORUM there were shown a number of illustrations of the architectural and building details of this development. This article will, therefore, be confined entirely to describing the business factors involved.

In order that the development of the Jackson Heights project may be clearly understood we give a brief description of the method of organization. In this development there have already been constructed approximately 60 apartment buildings, accommodating from 12 to 24 families each. Two companies were formed. One was a land company which owns a large tract of approximately 350 acres, located directly across the East River from the central business section of New York and having excellent transportation facilities by subway, elevated railroad and the Pennsylvania Railroad. The second was a building and holding company which purchases land as needed for construction from the land company. This may be considered the original owning company and the first important principle involved in this operation is that the buildings are completely constructed before stock is sold to the individual tenant. This in itself is an unusual feature as in most co-operative developments the tenants provide financing from the plans and make agreements to purchase before the building is constructed.

In reading later paragraphs of this article it must, therefore, be kept in mind that the original owners are in reality speculative builders, and that they operate according to a plan here briefly outlined.

Financial Organization

The land is purchased from the land company and an architect is commissioned to draw plans. A building loan and first mortgage is arranged on each building, usually with a bank, trust company or the loaning department of a life insurance company. The buildings are constructed through the purchase of materials and the placing of sub-contracts directly by the owning company. After a building is completed, so that its exact cost is known, the owning company adds its legitimate profit to establish a definite selling price for the entire building. The difference between the first mortgage and this selling price, or in other words the equity amount, becomes the amount of capitalization of a co-operative tenants' corporation which is to own this individual building and which is limited by the terms of its charter to the ownership, maintenance and improvement of a specific plot of ground and the building thereon. This provision is made to prevent any chance of speculation with the corporation money.

Having in this manner incorporated the equity in the building, stock is offered for sale to prospective tenants. The amount of stock purchasable depends on the number of rooms contained in the apartment which the tenant proposes to occupy. Under this plan all apartments are occupied by stockholders. There is a considerable difference at this point, however, between the principles of this operation and those of the average co-operative development. In the first place, the ownership of stock involves only a right to occupancy of the specific apartment on yearly lease by the original purchaser. This lease is renewable annually as long as the stockholder wishes to occupy the apartment. Each tenant-owner pays a monthly rental to his own corporation which is established approximately on the prevailing rental value and is to

cover interest, taxes and maintenance cost, the balance being paid out again in the form of a dividend which is paid in cash or, if the apartment has been bought on an easy payment plan, this dividend amount is credited to the tenant-owner's amortization account.

Details of a Typical Investment

In order to demonstrate clearly the exact financial operation of this transaction we give a complete financial outline of a typical purchase in any one of these buildings. The transaction is thus described:

A conservative first mortgage has been placed on the building, averaging approximately $800 per room. A purchaser of this typical five-room apartment pays approximately $10,500 on an easy payment basis. Of this amount, at the rate of $800 a room, $4,000 is in the form of a first mortgage, leaving an equity of $6,500 which he must pay. He is only called upon to provide $2,000 in cash, leaving an unpaid contract balance of $4,500.

The tabulation here shows how this $4,500 is paid off. It will be noted that the monthly payment of $134 is fair market value for an apartment of this class, but out of this amount $35 is directly credited as an installment payment, and the dividends out of the monthly rental of $99 are credited to the account of the tenant-owner. Thus in the fourth month of the seventh year, after paying a normal rental over this period and enjoying all community advantages, he is the owner of a valuable equity.

Equity	$6,500	Monthly rental	$ 99
Cash	2,000	" installment	35
Contract	$4,500	Total monthly	$134

With an initial cash payment of $2,000—monthly rental of $99 and monthly installment of $35 on contract—and crediting the estimated dividends on the equity at 7%—the entire stock equity will be paid in six years and four months.

	Installments	Estimated dividend @ 7%	Gross credit	Interest (deduct from gross credit)	Net credit	Total credit on contract end of each year
1st year	$420	+ $455 =	$875	— $270 =	$605	$605
2nd "	420	+ 455 =	875	— 234 =	641	1,246
3rd "	420	+ 455 =	875	— 195 =	680	1,926
4th "	420	+ 455 =	875	— 154 =	721	2,647
5th "	420	+ 455 =	875	— 111 =	764	3,411
6th "	420	+ 455 =	875	— 66 =	809	4,220
4 mos. of 7th year	140	+ 152 =	292	— 5 =	287	4,507

These credits, with the $2,000 initial payment, will pay in full the stock equity of $6,500. After the equity is paid, monthly cost is:

Rental	$99.00
Dividend (estimated at 7%)	37.92
Net monthly cost	$61.08

A feature of this plan is an agreement whereby all stock purchased is held by the original owning company for a period of five years. This avoids the necessity of placing a second mortgage on the property and as this owning company (as just explained) has a contract to manage the property, it is evident that if it does not so manage that the dividend is 7% as estimated, it in turn must have its money tied up over a longer period. Consequently the management contract is doubly safeguarded from the purchaser's viewpoint, as the managing Corporation not only works in general for the tenants' benefit but employs every reasonable effort toward economy.

All apartments are occupied by stockholders with the provision that if a stockholder finds it necessary to move he may give notice in July and vacate the apartment October 1 of any year. He is no longer liable for the rental and while he still maintains his stock ownership and receives dividends accordingly the apartment is actually rented to a tenant by the owners' corporation of which his stock ownership is a part. Conversely, stock ownership other than the original purchase does not carry with it a right to occupy an apartment. The stock owner may sell his stock to whom he pleases at any price he can get, but the new purchaser of the stock must receive the approval of the owners' committee before he can personally occupy the apartment in question.

When the stock of an individual building has been sold the title to the land and building passes to a company composed of the tenants. The Queensboro Corporation makes a contract to manage the building for a period of ten years with an option on the part of the tenant-owners to renew for a like period. As this organization has had extensive experience in management and has large purchasing power it is quite evident that such management will be more efficient than an amateur attempt at building management by a committee of tenants. Experience has shown that tenants are invariably satisfied with this arrangement. With entire management of the various buildings sold under this plan it is possible for The Queensboro Corporation to maintain excellent community conditions, which is of course highly desirable because of the extensive ownership of land and buildings in this vicinity by the original owning organization.

From the Tenant's Viewpoint

The advantages from the tenant's viewpoint in connection with this plan of co-operative development may be briefly summarized:

A tenant-owner is protected against an increase of rent, and he obtains in semi-annual dividends all earnings above the actual fixed charges and operating costs of the building, which, based on present costs of operation, are estimated at 7% on the amount he invests in the building.

The tenant-owner is protected against undesir-

able neighbors because he is a director of his own corporation and has a voice in their selection, and because the leases of the apartments are not assignable without the consent of the Corporation and its agent. The tenant-owner may surrender the lease of his apartment at the end of any year, on proper notice, and still retain his investment in the building.

Tenant-owners have equal rights in all activities, such as tennis courts, golf courses, community club, children's playgrounds and community gardens. He is eligible for membership in any of the community activities, subject to the rules of each separate organization. Each tenant-owner is his own judge as to what activities he desires. He may join all or none. There is no solicitation, and no assessment unless he participates.

Details of this plan, as outlined by Edward A. MacDougall, President of The Queensboro Corporation, at the recent Bridgeport Housing Conference, and quoted here, may bring out added points of interest.

Ownership and Incorporation. Each apartment building is owned by a separate company capitalized for the amount of the equity, whereof the entire stock is held by the stockholders in proportion to the number of rooms occupied by them, and all apartments in a given building have been leased to stockholders of such corporation for their own personal occupancy.

Mortgage. There is but one mortgage on each building, usually held by a savings bank or life insurance company.

Title. Title to the land and building passes to the company composed of the tenants. Each tenant-owner subscribes for an amount of stock which is proportioned to the size of the apartment which he occupies, and each tenant-owner may become a director in the corporation owning the building.

Terms of Payment for Purchase of Stock. After 20% cash has been paid on the stock subscription, the balance may be paid in monthly installments over a period of years.

Management. The Queensboro Corporation makes a contract to manage the building for a period of ten years, with an option on the part of the tenant-owners to renew for a like period. The Queensboro Corporation has managed apartments for many years and is enabled to effect the greatest possible economy. The fee for this service is the usual 5% of the rentals collected.

The Lease. With the purchase of his stock, the tenant-owner leases the apartment he has selected from his own corporation. This lease automatically renews itself from year to year. Should he



Example of Typical Unit in Apartments at Jackson Heights, Long Island, N. Y.
George H. Wells, Architect



Typical Floor Plan of Apartment on Page 113

wish to vacate for a year or more he may surrender his lease any October 1 by giving notice on or before the previous July 1. His liability for the rent then ceases and the apartment is leased to someone else.

Each tenant-owner signs the same form of lease. Leases are not transferable, which prevents undesirable persons from obtaining possession of an apartment. This is one reason why, under the Jackson Heights plan of tenant-ownership, the stock ownership and the lease are separated.

Rent. Each tenant-owner pays a monthly rent to his own corporation at the prevailing rental value for the premises occupied, which rent is fixed and cannot be raised without his consent. Gas and electricity are metered separately to each individual apartment and are paid for by the occupant. Garage accommodations are paid for by each individual user.

Sale of Stock by a Tenant-Owner. There is, of course, no restriction upon the sale of his stock by a tenant-owner, but such sale of stock would not carry the right to the buyer to occupy an apartment. Unless the buyer conformed to the standard of tenancy set by the Corporation, he could not lease an apartment.

The seller has the right to set his own price for the sale of his stock. If desired, The Queensboro Corporation will endeavor to sell his stock for him, charging the customary commission.

The Directors. Each tenant-owner is a director of the tenant-owner corporation, and it is the declared policy of the directors of the Corporation to divide all surplus earnings over and above the cost of operation, fixed charges and amortization. These earnings are estimated to average about 7% per annum on the investment.

Dividends. The Queensboro Corporation, as agent for the tenant-owners, collects the rent and makes all the disbursements on account of the operation of the building. The balance is a surplus which is available for dividends, which under the by-laws can be declared from time to time by the directors of each corporation. Apart from the duty of the tenant-owners as directors of the corporation of meeting twice a year to declare a dividend, they are relieved from all burden and care in connection with the management of the building. The tenant-owner is living in his apartment at the actual cost of running the building, and all rent paid in excess of this actual cost comes back to him.

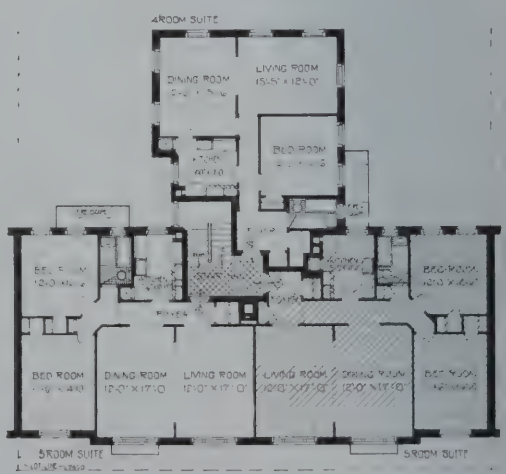
Reduction of the Mortgage. The mortgage is reduced annually by a sinking fund taken from the monthly rentals paid in by the tenant-owners. The mortgage is thus gradually reduced and paid during a period of years. The rentals also pay all the operating expenses of the building, such as taxes, insurance, heat, janitor service, mortgage interest, light of public halls, water rentals, maintenance and repairs.

Limitation of Each Corporation. By the terms of its charter, each corporation is limited to the ownership, maintenance and improvement of a specific plot of ground and the building thereon. This provision prevents any chance of speculation with the corporate money. Each corporation elects its own officers, but no officer receives a salary.

Taxes and Assessments Paid. The sale price of each building includes all taxes and assessments



Planted Plot between Blocks Showing Garages



Typical Floor Plan of Apartments on Page 111

paid to the time of passing of the title. The price includes also the paving of the street on which the building is located.

Some of the inquiries received by THE ARCHITECTURAL FORUM request information as to the rights and interests of tenant-owners in case the building is destroyed by fire or otherwise. It is evident that under this plan the ownership in the land and all other net assets lies jointly with the tenant-owners. In estimating net assets it must of course be realized that the holders of mortgages have a claim to full satisfaction from the returns of insurance payments.

Another question which has been asked is what will prevent any tenant from obtaining 51% control of the stock of the company. It is quite evident that nothing will prevent the acquisition of such control as far as owning a large percentage of the issued stock is concerned, but as this control can neither change the rentals of any apartments under the stock selling agreement, nor make it possible for the owner of the "controlling stock" (so termed) to introduce objectionable tenants or any features contrary to the agreement under which the stock was originally sold, it is evident that there is nothing to be gained by obtaining actual stock control.

It may be noted also that this investment by a tenant-owner is principally for the purpose of maintaining a reasonable rental and that from his viewpoint it is not a speculative investment. The only manner in which the building could be placed in the speculative market for re-sale would be through an agreement by all tenant-owners or by the outright purchase of all stock in the holding corporation.

APARTMENT buildings in the Jackson Heights Development contain no rear apartments in the usual acceptance of the term. Such apartments as do not face the streets look into inner courts or open spaces which are made of unusual size by placing together the courts of two adjoining structures. The exteriors of the buildings on the sides facing the courts are built of the same material as the street fronts and the courts themselves are made attractive with parked spaces, plantea with grass and shrubbery. Upon the wide paved areas which surround these parked spaces open the garages which are features of these buildings.

The fronts of the buildings are being worked out to present an appearance of architectural unity. There are no radical differences in height, and variations in material and certain details of exterior design will prevent monotony of appearance.



Type of Unit Developed in Apartment Buildings at Jackson Heights, Long Island, N. Y.
George H. Wells, Architect

EDITORIAL COMMENT

ENCOURAGING HOME BUILDING

THERE have been under discussion during the past two or three years many proposed methods by which the housing shortage could be relieved. These have been of interest to the architectural fraternity as potential factors tending toward an increase in the volume of building construction. The methods and effect of practical measures which have recently been put into force in various sections of the country are, therefore, well worth consideration.

Through its approval by the Board of Aldermen of New York a realty tax-exemption measure now becomes a law, offering special inducements to those who have built, or will build, residence structures between April, 1920 and April, 1922. This measure provides for an exemption of real estate tax up to $5,000 on the appraised valuation of each individual dwelling or each apartment in a multi-family structure over a period of ten years from the time of completion. Based on a tax rate of $2.85 this means a direct saving of approximately $1,400 per unit which will help to offset any depreciation of replacement value which may occur during the next few years.

The practical effect of this measure was reflected in the real estate news of New York within one day after its final approval. A number of real estate transactions involving the purchase of recently constructed apartment houses, which had been held pending action by the Board on this measure, were consummated. Several large speculative building organizations, which were offering a number of newly constructed dwellings and moderate cost apartments on the co-operative basis, were able to advertise that a $1400 saving could now be enjoyed by purchasers of their offerings. It is particularly interesting to note that in the co-operative apartment house developments of The Queensboro Corporation, which are completely described in the Business and Finance Department of this issue of THE ARCHITECTURAL FORUM, it is now possible to reduce the owner's rental approximately $10 a month because of this tax-exemption.

Immediately upon the passing of this measure the number of inquiries from prospective home owners and home builders increased extensively and, judging by inquiries for vacant residential lots and reports from some architects' offices, it would seem that the amount of residential construction in New York during the period covered by tax-exemption would be enormously increased.

With the precedent set in New York there is no reason why this question of tax-exemption on new buildings of the residential class should not become a live subject in every community in the United States. The definite saving which is offered through a measure of this kind can be easily appreciated by prospective home builders and purchasers, and as it represents from 10 to 15% saving on the cost of the dwelling it will undoubtedly appeal to an investor of this class. From the viewpoint of the city or community this tax-exemption does not represent a great amount. On the other hand, it means an increase in the total appraised valuation of real property which in turn reflects beneficially on city credit. It means also the increment in general land values where new communities may develop, adding again to the tax revenue. It means a practical method of relieving a local housing shortage.

In discussing the question with a prominent official closely connected with building loan institutions, we have been definitely assured that a tax-exemption of this nature will tend to encourage more liberal financing of dwelling construction as it reduces the danger, supposed or actual, of deflation in collateral valuation. Above all, such a measure has a direct effect in restoring public confidence in the building situation. It would seem, therefore, that architects everywhere have an opportunity to sponsor local action of this kind which is certain to follow if sufficient public pressure can be exerted.

The effect of a general demand by the public for increased consideration on the part of banking institutions regarding building and permanent loans on dwellings is being felt at various points in the country. The reduction of the volume of commercial credits and unusual investment opportunities is bound to be reflected in the mortgage loan field, particularly in view of an average reduction in cost, approximately 20%. Here again architects may exercise a certain influence in following more closely the local building loan situation. We are told that throughout the East building loan associations are placing every available dollar and using all their credit capacity in making loans for dwelling construction. At any point in the country where this is not the case, there seem to be logical arguments now why building loan associations should become particularly active. On behalf of his clients it will pay an architect to study the methods and operation of building loan associations and to maintain his contact with them as well as with mortgage money sources.

From the building field we have the information that contractors are now able to give closer figures, owing to the fact that the labor situation is better. A definite schedule of reduction in labor costs has been adopted by the Building Trades Employers in Chicago and at other important points.

The entire situation is one which offers many opportunities for architects to contribute, sometimes indirectly, to the efforts now being made toward the stimulation of building activity, for we are on the verge of an indeterminate period in which every individual effort is of value.

In the final analysis, all arguments in favor of Raymond Concrete Piles come down to the basic factor of certainty—the protecting steel shell is left in the ground.

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Manufacturers' Catalogs and Business Announcements

CATALOG REVIEW

ATLANTIC TERRA COTTA COMPANY, 1170 Broadway, New York, N. Y.

"Questions Answered" (5¼ x 7½ ins.). 32 pp.

The production of terra cotta is more or less of an enigma to those who have not been initiated into the fictile arts. To promote a wider knowledge of terra cotta in the field of construction and design this little book presents a score or more of major questions which are fully answered in an orderly manner. In making clear certain points, there are included a number of illustrations which have been chosen for their helpfulness—some of the best known examples in their line appearing. Besides being a valuable collection of information this is an attractive piece of booklet making.

CRANE COMPANY, South Boston, Mass.

"Homes of Comfort" (5½ x 8½ ins.). 100 pp.

In the science of sanitation the Crane line has become widely recognized. This book of theirs serves as a partial catalog to those who are about to build or remodel a home, and only such fixtures for bathrooms or kitchens are shown as would be particularly adaptable. Several model bathrooms or combinations of installations are pictured so that it will not be difficult to visualize the most up-to-date appointments. Toward the back of the book are found small specialties and general kitchen equipment together with fittings supplied in connection with other devices. There are nearly three hundred illustrations, each with complete explanation.

C. A. DUNHAM COMPANY, Fisher Bldg., Chicago, Ill.

"The Dunham Hand Book" (3¾ x 6¾ ins.). 144 pp.

A working guide of universal appeal is the compact book issued under the above title. While it passes over the Dunham heating specialties in an introductory manner, necessary information for their use is given. The greater part of the contents is taken up with data of a very practical nature from tables and formulae, standard symbols and diagrammatic layouts to estimating and calculation. Outlines of steam heating systems with a glossary of terms used by engineers furnish the architect with a comprehensive idea of the principles of erecting and testing a plant. The amount of matter compiled is deserving of praise and should make a definite place for this work among the books used for planning layouts.

Advice on Acoustics

GEORGE C. HANNAM

Acoustical Engineer

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ANNOUNCEMENTS

Mr. Francis J. Taylor, architect, formerly architectural engineer in the office of the Mechanical Engineer for the Bethlehem Shipbuilding Corp., Ltd., announces the opening of offices at 216 E. Lexington st., Baltimore, Md. Manufacturers' samples and catalogs requested.

(This was incorrectly printed in the February issue as Mr. Joseph J. Taylor.)

Mr. C. Howard Crane, Detroit, Mich., announces the opening of an office at 562 Fifth avenue, New York, N. Y. under the direction of Mr. E. M. Mlinar, formerly with Thomas W. Lamb, New York City. Manufacturers' samples and catalogs requested.

Mr. Hugh T. Keyes announces the opening of an office at 425 Murphy Building, Detroit, Mich. for the practice of architecture.

Mr. Leonard Schultze and Mr. S. Fullerton Weaver, C.E. announce the formation of a partnership for the practice of architecture under the firm name of Schultze & Weaver with offices in the Elliman Bldg., 17 East 49th street, New York, N. Y.

ROTCH SCHOLARSHIP EXAMINATIONS

THE preliminary examinations for the Rotch Traveling Scholarship will be held at the office of the Secretary, C. H. Blackall, 20 Beacon street, Boston, on Monday and Tuesday, April 11 and 12, 1921, at 9 A.M., to be followed by the sketch for Competition in Design on Saturday, April 16. The successful candidate will receive annually for two years an amount which it is hoped will not be less than $1,400 per year, to be expended in foreign travel and study during two years.

Candidates must be under thirty-two years of age and must have been engaged in professional work during two years in the employ of a practicing architect resident in Massachusetts. Holders of a degree from a recognized architectural school may present their certificates in lieu of the preliminary examinations. Candidates are requested to register at the office of the Secretary as long before the examinations as practicable.

M. I. T. SCHOLARSHIPS

TWO scholarships of three hundred dollars each are offered in the scholastic year of 1921-22 for special students in the fourth year of the course in Architecture at the Massachusetts Institute of Technology. They will be awarded as the result of a competition in design under the direction of the Committee on Design of the Department of Architecture.

The competition is open to citizens of the United States of good character, who are between twenty-one and twenty-eight years of age, and who have had at least three years' office experience. Competitors must, however, present satisfactory evidence of a knowledge of descriptive geometry.

The competition will be held in July, 1921. Competitors are allowed to prepare their drawings wherever conditions conform to the requirements of the Committee, but these drawings must be sent to Boston for judgment.

Applications should be received before May 1, addressed to Professor William Emerson, 491 Boylston street, Boston, Mass.

THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 4

CONTENTS for APRIL 1921

PLATE ILLUSTRATIONS

	Architect	Plate
BUILDING FOR THE HARTFORD TIMES, HARTFORD, CONN.	*Donn Barber*	49–51
BUILDING FOR THE TRAVELERS INSURANCE COMPANY, HARTFORD, CONN.	*Donn Barber*	52
CONNECTICUT STATE LIBRARY AND SUPREME COURT BUILDING, HARTFORD, CONN.	*Donn Barber*	53–55
LIBERTY NATIONAL BANK, WASHINGTON, D. C.	*Holmes & Winslow*	56, 57
SODA AND CANDY SHOP, BROOKLINE, MASS.	*James Charles Flaherty*	58
THE BRUNSWICK SHOPPE, HOTEL BRUNSWICK, BOSTON, MASS.	*Blackall, Clapp & Whittemore*	59
HOUSE, BALDWIN, N. Y.	*Fred B. Smith*	60, 61
LIBRARY IN HOUSE OF A. L. SEARLE, ESQ., MINNEAPOLIS, MINN.	*Trowbridge & Ackerman*	62
DINING ROOM IN HOUSE OF MRS. WILLARD D. STRAIGHT, NEW YORK, N. Y.	*Delano & Aldrich*	63

LETTERPRESS

	Author	Page
COVER DESIGN, BELLS OF SAN ANGEL, MEXICO Drawn by O. R. Eggers		
THE EDITORS' FORUM		49
TOWER, TRAVELERS INSURANCE BUILDING	*Frontispiece*	
SOME RECENT WORK IN HARTFORD, CONN. Donn Barber, Architect		115
AN OUTDOOR EXHIBIT AT THE METROPOLITAN MUSEUM, NEW YORK	*Edward H. Putnam*	121
THE CENTRAL MANUFACTURING DISTRICT, CHICAGO, ILL. Part I.	S. Scott Joy, Architect	123
DEPARTMENT OF ENGINEERING Calculation of Stresses in Wooden Trusses, *Milo S. Farwell.* Steel Construction, Part I, *Charles L. Shedd, C.E.*		129
MINOR ARCHITECTURE DEPARTMENT Innovations in Small Store Design		135
DETAILS OF EARLY SOUTHERN ARCHITECTURE Measured Drawings by Goddard M. White		139
DECORATION AND FURNITURE DEPARTMENT Decorative Fabrics Following Original Designs		143
BUSINESS AND FINANCE DEPARTMENT Have We Reached the Turning Point? Results from Tax-Exemption		147
A SMALL HOUSE AT YONKERS, N. Y. Arno Kolbe, Architect and Owner		151
EDITORIAL Calder Committee Report		152

ALBERT J. MacDONALD, Editor

Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.
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ROGERS AND MANSON COMPANY, Publishers
are now located at 142 Berkeley Street, Boston 17, Mass.

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THE EDITOR'S FORUM

HOSPITAL LIBRARY AND SERVICE BUREAU

WITH the rapid advance in the planning and equipment of specialized types of building, it becomes increasingly difficult for architects to keep in close touch with new developments. In the field of hospital planning there has recently been inaugurated a service which promises to be of great assistance to architects.

This is known as the Hospital Library and Service Bureau and it has been organized by national hospital, public health, social service and other organizations, aided by the Rockefeller Foundation, to serve gratuitously all persons interested in the construction, equipment and operation of hospitals and institutions of like character.

The headquarters is maintained at 22 East Ontario street, Chicago, and the feature of particular interest to architects is the library which will be collected and classified and from which data will be readily available. The classifications of service which will particularly meet architects' requirements are thus made:

(1) Plans, drawings, and other data pertaining to the construction of hospitals, dispensaries, first aid rooms, etc., also follow-up of all new hospitals within one year of their opening for the purpose of appraising efficiency.
(2) Complete record of hospital architects, with lists of hospitals planned by them.
(3) Records of equipment in new hospitals, dispensaries, etc., and a follow-up for the purpose of ascertaining what parts of the equipment proved unnecessary.
(4) Indexes of hospital equipment and supplies, and equipment necessary for certain work, with cost estimates.
(5) Health and hospital literature and reference works on community problems, vital statistics, social service, public health, nursing, legal subjects, new laws and pending legislation affecting hospitals.
(6) Material and data concerning preliminary educational and publicity work incident to the promotion of building and equipment.

SUGGESTION FOR A. I. A. CONVENTION

IN view of the present unsettled conditions of the building industry and the opportunity that the coming national convention of the American Institute presents for a comparison of economic conditions obtaining in the industry, this resolution of the Illinois Chapter has particular importance.

WHEREAS, in the opinion of the Illinois Chapter of the American Institute of Architects, a most remarkable fund of knowledge, experience and information is made available by the convening of the representative architects of the United States in the annual convention of the American Institute of Architects in Washington, and

WHEREAS, the opportunity for the discussion of economic problems of the building industry is seldom so great and so conducive to results,

NOW THEREFORE, BE IT RESOLVED by the Illinois Chapter A. I. A. that it firmly believes that the Board of Directors of the American Institute of Architects should set aside a time or times as a definite part of the program of the convention for a constructive discussion, with its resultant conclusions, upon ways and means to better the highly unsatisfactory economic situation in the building industry,

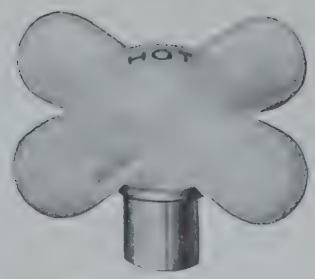
AND FURTHER, that a time or times in the regular program of the convention should likewise be set aside for discussion of the very commendable and constructive bills now pending before congress under the authorship and guidance of Senator Calder, with a view of formulating suitable resolutions in favor of this proposed legislation.

CAMPAIGN TO AID BUILDING

THE National Federation of Construction Industries has plans under way by which it hopes to bring together manufacturers of material, contractors and workmen to launch a nation-wide campaign by May 1 to encourage building. If such a meeting can be made effective in developing plans that will bring about unity of action, with the sincere intention of eliminating every unnecessary expense entering into the cost of producing materials, and will bring labor to the realization that its contribution must be a fair day's work for a fair day's pay, something tangible may be expected to result from it.

What seems to us a more definite attempt for eliminating waste, and therefore giving greater promise of reducing cost, is the proposal of the Department of the Interior, headed by Secretary Hoover, to work out a unified building code for the benefit of the entire country.

It is well known to all architects whose practice covers a wide territory, that the difference in requirements between one city and another is amazing, and that in this item alone a great deal of waste creeps into building construction. There seems to be no way by which one community can accept the results of investigation in another, and as a consequence there is not only tremendous duplication of investigating but, what is worse, widely differing requirements arbitrarily imposed by local authorities. The formation of a central authority, which would pass upon materials and specify the kinds and strength of construction required for specific types of building, would be an improvement of immense value, and affect economy of construction.



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Donn Barber, Architect

TOWER OF THE TRAVELERS INSURANCE COMPANY
FROM THE CONNECTICUT RIVER AT HARTFORD

The ARCHITECTURAL FORUM

VOLUME XXXIV APRIL 1921 NUMBER 4

Some Recent Work in Hartford, Conn.

By DONN BARBER, ARCHITECT

BUILDING conditions during the past few years have been such as to almost entirely preclude the erection of residence structures of any kind, and a large proportion of such building as has been done has taken the form of structures for the use of certain types of business, and in some instances of buildings for state or municipal uses.

In Hartford, Conn., there have been completed during this period several structures for these purposes, illustrations of which are included here. Business is served in the buildings which have been erected for the Travelers Insurance Co. and *The Hartford Times*, and the massive structure on Capitol avenue serves for the housing of certain departments of the state government; these illustrations show the appearance of this structure in its finally completed form.

STATE LIBRARY AND SUPREME COURT

Near one edge of the extensive grounds of the state capitol at Hartford there has been built the dignified and monumental structure which houses the State Library and the Supreme Court, besides containing a Memorial Hall. The building is T shaped and consists of wings grouped about a central pavilion which has been designed with a three-arch motif, the arches being separated by columns which support an attic story. The exterior walls are of white granite of fine texture and tone, and sloping roofs are covered with copper, while flat roof surfaces are of vitrified tile.

Although not shown on the plan given, the central or main hall, Memorial Hall, the Library reading room and the Supreme Court room extend through both the first and second stories of the building, and thus occupy practically all the available space except in the case of the central hall where, owing to the greater height of the building at this point, there is a large attic area which has been provided with means of communication and access so that in case of future need this space can also be equipped and occupied for public purposes.

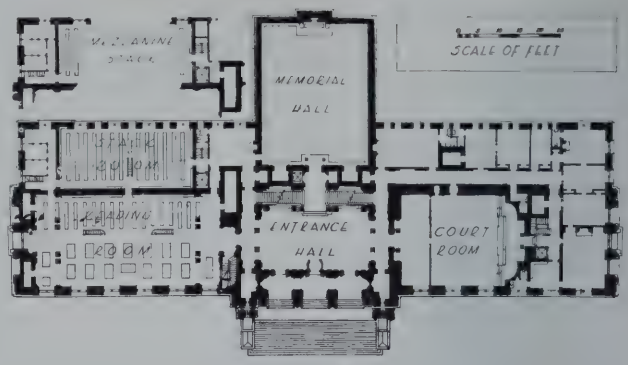
The main or first floor upon which are located the main reading room of the State Library, the Memorial Hall and the court room and principal offices of the Supreme Court, is reached at the middle of



General View of State Library and Supreme Court

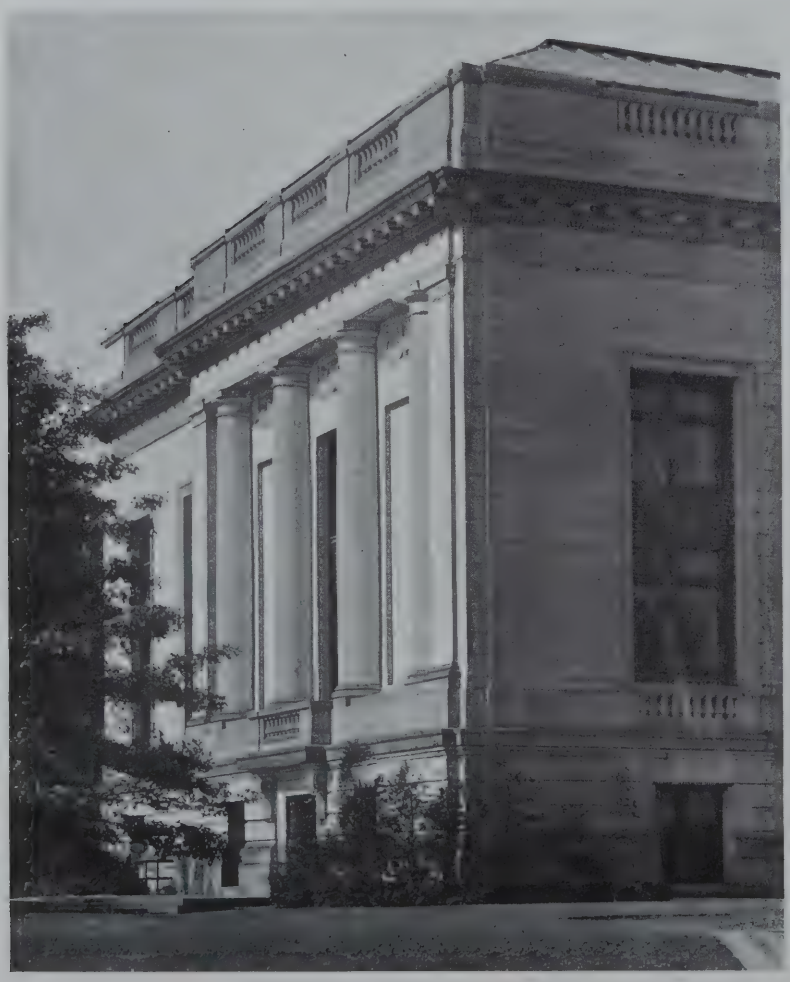
the Capitol avenue front by a broad flight of granite steps, leading between large columns and across a vaulted porch to three doorways which open immediately into the large central or main hall which forms the center of the general plan. This is a large room with barrel vaulted ceiling formed of richly coffered paneling. This ceiling starts from a cornice which is carried by massive columns and pilasters. The entire floor of this hall, together with the entire wall surfaces from the floor to the top of the cornice, including the columns, pilasters and gallery railings, is executed in marble of buff color. The coffered ceiling has been executed in plaster decorated in color. The ceilings above the galleries overlooking this hall are also formed of decorated plaster and supported upon marble arches. The gallery at the south of the hall overlooks Memorial Hall.

Located at the east or left of this central hall and opening from it is the main reading room of the State Library. Located at the right, or west, and opening from it is the Supreme Court room and its several departments, and adjoining on the south, directly opposite the main entrance but beyond the main stairway, is placed the Memorial Hall.



Main Floor Plan, State Library and Supreme Court

The Supreme Court, as already said, occupies the west wing of the building. South of the court room but separated from it by a wide corridor which opens into the central hall are the lawyers' retiring room, and offices of the messengers, clerks and reporters and the suite of the chief justice, with suitable vaults. Beyond the court room to the west is the consultation room for the judges. The interior of the Supreme Court room is wainscoted in paneled oak of rich design for a height of eight feet above the floor. The walls from this wainscoting to the frieze are finished in artificial Caen stone with simple wall surfaces and richly decorated cornice. Above this cornice is a deep frieze treated as a part of the ceiling of the room and executed in richly paneled and decorated plaster treated with color.



Detail of Library Wing, State Library and Supreme Court

It has long been considered almost impossible to combine in one large room a library, a portrait gallery and a museum, and have them all successful. One seems to be always subservient to the others. In this building provision has been made in the Memorial Hall for the proper hanging of the portraits of the governors, Gilbert Stuart's portrait of Washington, and the display of the old charter. This new arrangement will not only make it possible for portraits to be properly hung and lighted, but will exclude noise and confusion from the Library.

The walls of the Memorial Hall are covered with oak wainscoting forming a dado up to the height of the usual picture railing, above which to the under side of the cornice the walls are hung with woven material as a background for paintings. Above the cornice a wide cove, which is broken by penetrations on all sides, reaches to the ceiling. These penetrations form effective

places for the display of special memorials. There are no windows in this room, which is amply lighted by means of a ceiling light with a skylight above, forming the entire ceiling of the room within the limits of the cove. The electric lights for illuminating this room at night are placed above the ceiling and so arranged as to faithfully produce the effect of daylight, while the lamps themselves will not be visible from any point.

The cornice and coved ceiling of Memorial Hall are executed in richly decorated plaster treated in subdued colors. At the far end of the room, directly facing the entrance from the central hall, a large alcove or niche is formed, in which is placed, upon a raised dais, the special vault containing Connecticut's historic charter. Above this is hung the Stuart portrait of Washington. The floor of this room is of decorative tile. The ground floor below this hall is occupied by the packing room, repair shop and bindery, general store room and locker room of the Library which are easily reached by the service elevator and stairs adjoining.



Entrance to Record and Newspaper Rooms of State Library

As the State Library, Supreme Court apartments and Memorial Hall are conveniently grouped about the central hall, so also are the several departments of the Library conveniently grouped around the main reading room. Along the south side of this room are placed the two-story steel stacks with open shelves for the accommodation of the law library and general works of reference. The rest of the floor space is occupied by the special study and reference tables, with catalog cases conveniently located for service.

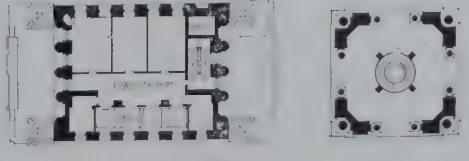
The interior of the main reading room is treated in the same manner and in style harmonious with the Supreme Court room, except that all of the available wall surfaces in this room for the height of 14 feet are here covered with steel bookcases and steel wainscoting. The reading room is equipped with fireproof furniture. In the treatment of this room it has been planned to eliminate the use of wood.

Conveniently located near this main reading room are the librarian's office, the main stack room, the special study and stenographers' rooms, the special vaults for the accommodation of archives, records, valuable papers and special collections, the newspaper room, and rooms for cataloging, repairing, packing and storage.

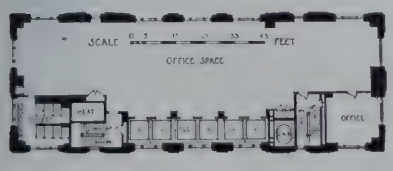
Opening from the main room on the south, just west of the stack room, is the librarian's office directly connected with the main reading room, stack room, Memorial Hall and central hall, all of which are on the ground floor, and by means of the adjoining stairs and service elevator having communication with the cataloging rooms and galleries above and with the several departments on the floor below. Located immediately under the main reading room and connected with it by a special stairway are the record and newspaper rooms.

THE TRAVELERS INSURANCE COMPANY

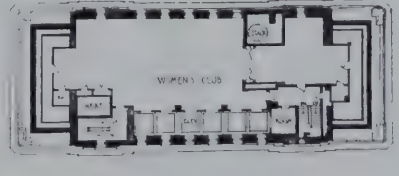
The structure of great height which is visible for miles in any direction from Hartford is the home office or headquarters of the Travelers Insurance Co. In addition to providing office space,



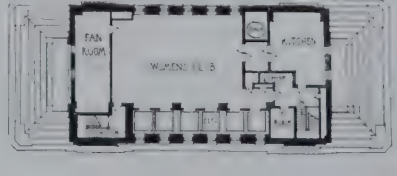
Twenty-third and Twenty-seventh Floors



Eighteenth Floor Plan



Twentieth Floor Plan



Twenty-first Floor Plan

Building for the Travelers Insurance Company

arranged with great efficiency and with direct reference to the requirements of the particular purpose in view, the building by reason of its great size and strikingly original design possesses advertising or publicity features which are of considerable value to its owners.

The building has grown gradually and has been developed to keep pace with the growth of the clerical force and official personnel. These forces numbered 482 when the north wing of the building was constructed in 1907, and 955 in 1913 when the south wing and the Main street front were finished, while at present, with the extension of the south wing to Prospect street and the construction of the tower over it, the home office accommodates a staff which numbers 4,000.



Detail over Entrance Portico of *The Hartford Times*

Designed in a free adaptation of the renaissance, the building combines consistent simplicity in its scheme with dignity and unity in its expression, massive proportions and boldness of detail. The building is of composite construction, consisting of a framework of steel bearing an anchored covering of stone and brick. The exterior walls are built of pink Westerly granite and the inner walls, which face upon various interior courts, are of light colored brick. It is interesting to note that the quarries at Westerly, Rhode Island, from which the granite was procured, were first developed by James G. Batterson who also founded the Travelers Insurance Co.

Architecturally speaking, the first three floors of the building constitute a base for the next floors, the 4th to 8th inclusive, which unite to form one architectural feature; the 9th is treated as a frieze carrying the massive copper cornice, above which is a 10th floor, set back somewhat from the front and but slightly visible from the street. With these ten stories as a base there soars into space the great tower, an impressive and monumental structure 34 stories in height. The top of the lantern is 527 feet above the sidewalk, a height exceeded by but few buildings in the world. Up to the 15th floor the tower maintains the architectural lines of the main building; the 16th story is treated as a horizontal band, while the 17th and 18th are developed as an arcaded motif.



Building for *The Hartford Times* by Night

Above the 20th floor the tower is set back on its long dimension and three stories serve as a base for the Ionic colonnade which extends through the 25th story; above the colonnade the tower recedes to form a square which is finished symmetrically on all sides. At the 27th floor a loggia is developed, 359 feet above the street, the four corners of the roof being supported by piers and free Doric columns. Upon each side the balcony is formed by a Palladian arch and a balustrade. The roof of the loggia is pyramidal, sloping to a second lookout just below the cupola. Up to this point the entire tower

is of stone, but the cupola is of metal. The lower portion of the cupola is utilized as an outlet for the smokestack and the upper portion, built to form the crowning feature of the structure, supports a finial with a cluster of metal balls varying in diameter from 4 to 20 inches. This cupola or lantern which is 81 feet high is of copper covered with gold leaf. Under the cupola, at the 34th story level, there is a beacon consisting of 44 projectors of from 200 to 400-watt power, throwing a solid band of white light which is visible for many miles.

Looked at from the east or west the tower appears quite slender, while from the north or south it shows considerable breadth—a great white cliff, studded with windows and surmounted by a series of classic building units of diminishing size, rising successively in agreeable composition. The narrower face of the tower assumes approximately the proportions of a Corinthian column; that is, the ratio of its width to its height is about 1 to 10½. The corresponding ratio is 1 to 11 in the Washington Monument, and in the campanile of St. Mark's it is about 1 to 9. The accuracy of the Travelers tower, built for utility as well as for beauty, is thus emphasized. The tower is filled with offices up to and including the 24th floor.

BUILDING FOR *THE HARTFORD TIMES*

Another instance of successful designing done in this office is the building of *The Hartford Times*. The planning of this structure, and the interesting use of terra cotta detail and other material from the dismantled Madison Square Presbyterian Church in New York, were described in THE FORUM for April, 1920 and the illustrations included here merely prove anew the success with which this material has been adapted.

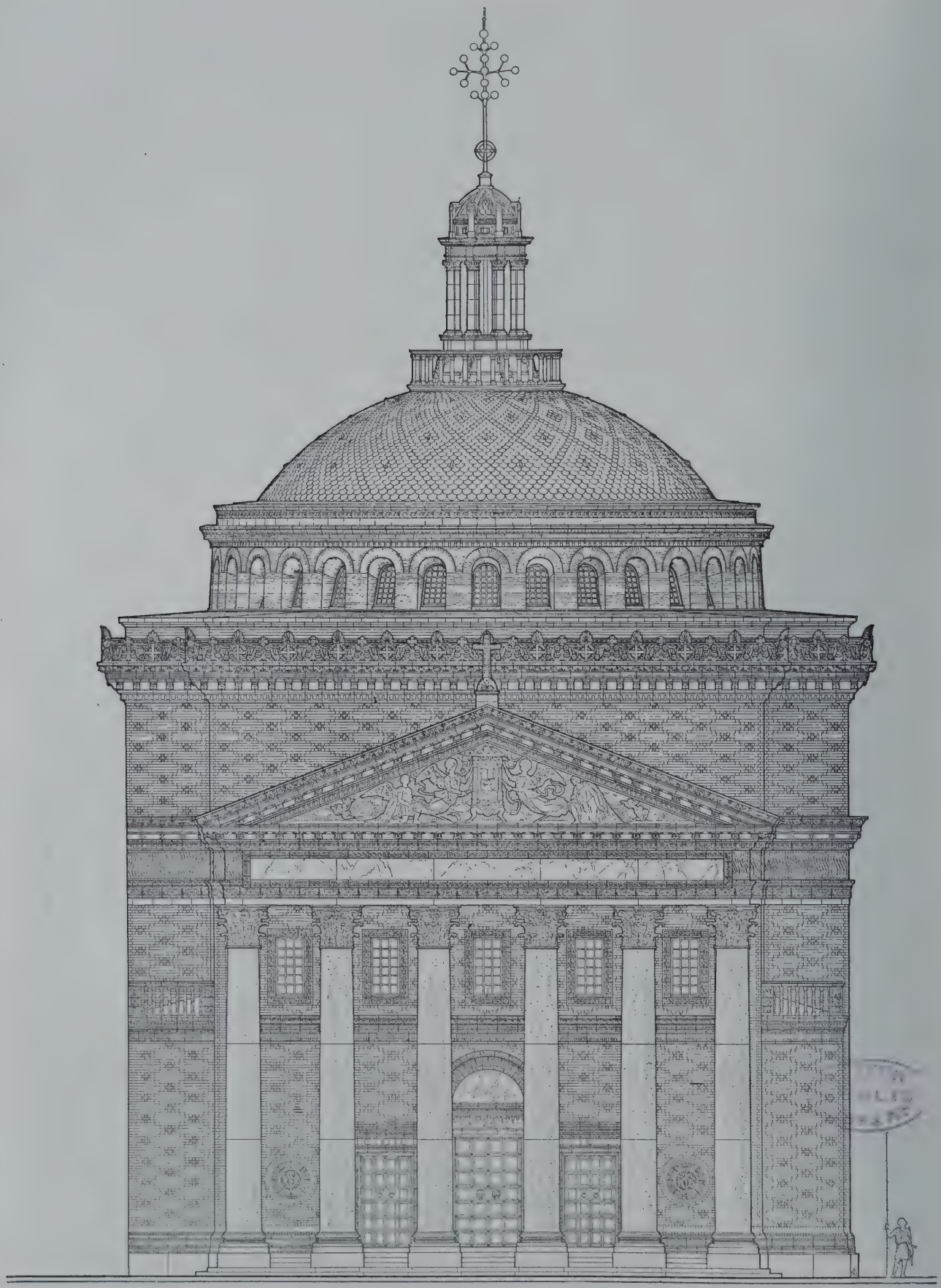
As has already been noted, the *Times* building is placed at the end of New Atheneum street and the building is seen at the end of this short street between the long facades of the Morgan Memorial at the left and the Municipal Building at the right. Both these neighboring structures are of very moderate height and the *Times* building is of much the same height so that the water table lines and the balustrade motifs of all three buildings are in agreement.

In this newer building has been included the greater part of the exterior material from the church; the columns, pilasters and cornices have been used, and also the steps, platforms and base courses, fitted together as placed originally, excepting for a change in the positions of the pilasters. It was necessary that a colonnade motif of seven bays be used instead of a porch motif of five. The large, circular headed windows which lighted the church upon the 24th street side are now used to form the entrance doors within the arcade, and the windows which were behind the columns on the Madison avenue facade, together with the two side doors which led into the vestibule of the church, appear within the arcade.

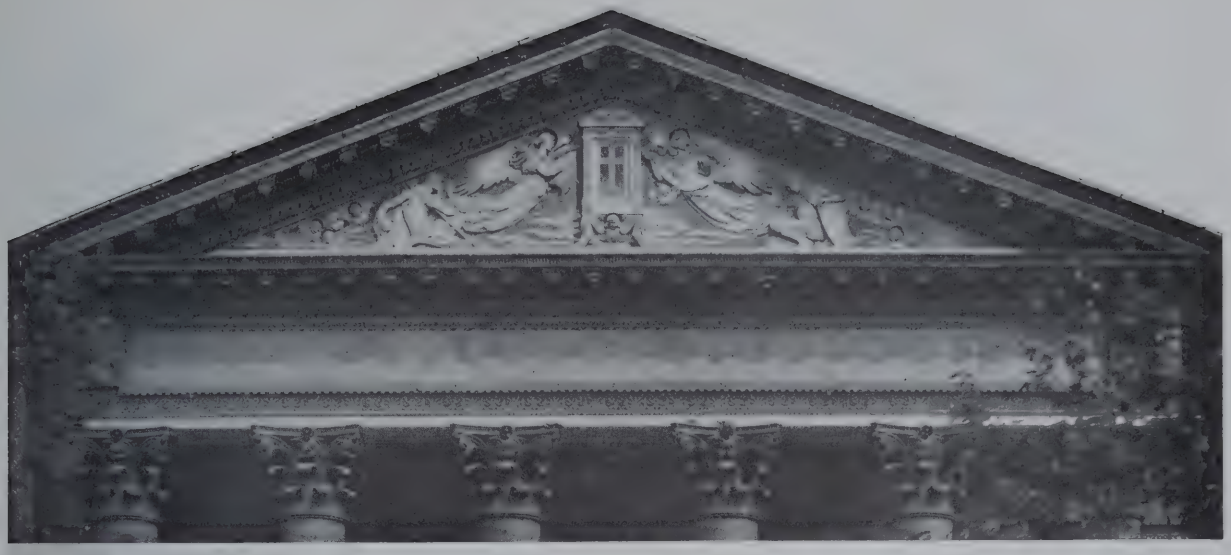
It was found to be impossible to adapt, for this newer building, the richly wrought terra cotta Corinthian capitals which were so notable a detail of the church, and new Ionic capitals have been used instead. The pediment and two circular windows which also contributed so largely to the splendor of the church have been utilized in another building, which is described elsewhere in this issue of THE FORUM.



The Newspaper Plant which Includes Material from the Notable Dr. Parkhurst Church



WEST ELEVATION, MADISON SQUARE PRESBYTERIAN CHURCH, NEW YORK
McKIM, MEAD & WHITE, ARCHITECTS



An Outdoor Exhibit at the Metropolitan Museum of Art

PEDIMENT OF THE MADISON SQUARE PRESBYTERIAN CHURCH

By EDWARD H. PUTNAM

THE preservation of an example of modern architectural art by the Metropolitan Museum establishes a precedent that, if followed with judgment, should prove to be of great interest. There are several small wings on the Central Park side of the building, built of brick and severely plain, since it is intended that future additions shall entirely conceal them. Of course integral parts of complete designs would not be consistent in such a setting, but it cannot be denied that they would add material beauty to the buildings, if beautiful in themselves, and a plain brick background, which makes no architectural pretense, is the safest setting that could be found.

Two years ago the Madison Square Presbyterian Church was taken down; wrecked is not the word. The marble columns, the beautiful polychrome terra cotta capitals, jambs, lintels, cornice frieze and pediment panel, even the specially made brick were taken down carefully by hand. Instead of chuting the material into a waiting wagon to be sold second hand or for junk—as is the case with too many demolished buildings—the marble columns and most of the other exterior details were used on an important secular building in New England, the door jambs and lintels were taken by Mr. Lawrence White for his Long Island home, and the terra cotta faience pediment panel and two circular windows of reticulated terra cotta have been set in one wall of the library wing of the Metropolitan Museum, the wall having been increased in width to accommodate the three details. There the panels will remain for generations to come, an enduring memorial to Stanford White, and an example of much that is best in American ecclesiastical architecture.



The Three Details as They Appear on the Library Wing

Probably the genius of Mr. White was never better expressed than in the design of the Madison Square Presbyterian Church. Standing in a busy commercial district and overshadowed by the Metropolitan Tower—the second highest building in New York—the church seemed to fit its setting, belonged where it was placed, and its individuality impressed itself on the passerby. Its design and its color gave it a prominence that could not be denied. It is unfortunate that such a novel and successful example of architecture should have outgrown its usefulness, but in the city's northward march the location became inaccessible to the members of the church's congregation, and its end was inevitable. At the request of the original donor the trustees of the church presented the panel to the Metropolitan Museum, so that its preservation might be assured.

The Madison Square Presbyterian Church was the first important instance of the use of polychrome terra cotta in this country, and as such it marked the revival of an art that died with the Della Robbias. In the hands of Mr. White it was a complete success, and although polychrome has come into increasing vogue of late years, it is doubtful if the success with which it was used here will ever be surpassed. The plan of the pediment panel, the dominant feature of the church, was originated by Mr. White, designed by H. Siddons Mowbray, modeled by Adolph A. Weinman and executed in polychrome terra cotta. The figures are in cream white against a background of blue. In the base and cornice that surround the panel, the major color is dark yellow enlivened with blue, sienna and green.

A word might be added regarding the two circular window grilles of terra cotta, since their use within the portico of the church formed one of the most interesting details of a highly distinguished building. While open work, or reticulation, of terra cotta can hardly be regarded as unique or even unusual, it is only rarely that it attains a result as successful as was secured in this instance. The pale gray of the terra cotta, with its richly intricate Byzantine design backed by sheets of iridescent glass, formed a notable detail which, in its original setting, was readily appreciated as it was placed upon the eye level.



The Portico of the Madison Square Presbyterian Church
Showing Original Setting of the Pediment

Royal Cortissoz in the *New York Tribune* thus describes the pediment:

"The decoration has for its subject 'The Adoration of the Shrine of Truth.' The central shrine or tabernacle is supported by angels with harp and scroll, and these angels who, with the cherubim placed at different points in the composition, chant the praises of God, are symbolical of religious song and word. The knight on the right of the shrine represents the Church Militant. In the same position on the opposite side is a shepherd whose meaning is equally obvious, and the two together illustrate the equality of the mighty and the humble. The sun and moon are also indicated against the starry blue background. The idea embodied in this decoration is very beautiful and it has been developed with remarkable grace and skill. Both in its linear qualities and in the play of subtle modulation which belongs to a work in relief, the sculpture is free and even picturesque, yet kept well in hand, so that the final impression received is one of suave delicacy." Such is the pediment now permanently placed.

The Central Manufacturing District, Chicago, Ill.

PART I. GENERAL FEATURES OF OPERATION

By S. SCOTT JOY, ARCHITECT

WITH the growth of Chicago, and the development of various industries, there has come the necessity of opening up new districts for the use of business. In Chicago there is endless opportunity for such growth, for in three directions there exists boundless area, much of which is adapted for such uses.

The Central Manufacturing District owes its inception to the expansion of the Chicago Junction Railway. This railway is of the type commonly known as an "inner belt line" and connects directly with all the railroads entering Chicago, having been built originally to serve the Union Stock Yards and the packing industries. After a growth of some years, however, the Packingtown and Stock Yards districts were fully occupied and it became necessary for the Chicago Junction Railway to seek the development of other districts which would contribute tonnage and allow the railroad's growth to continue.

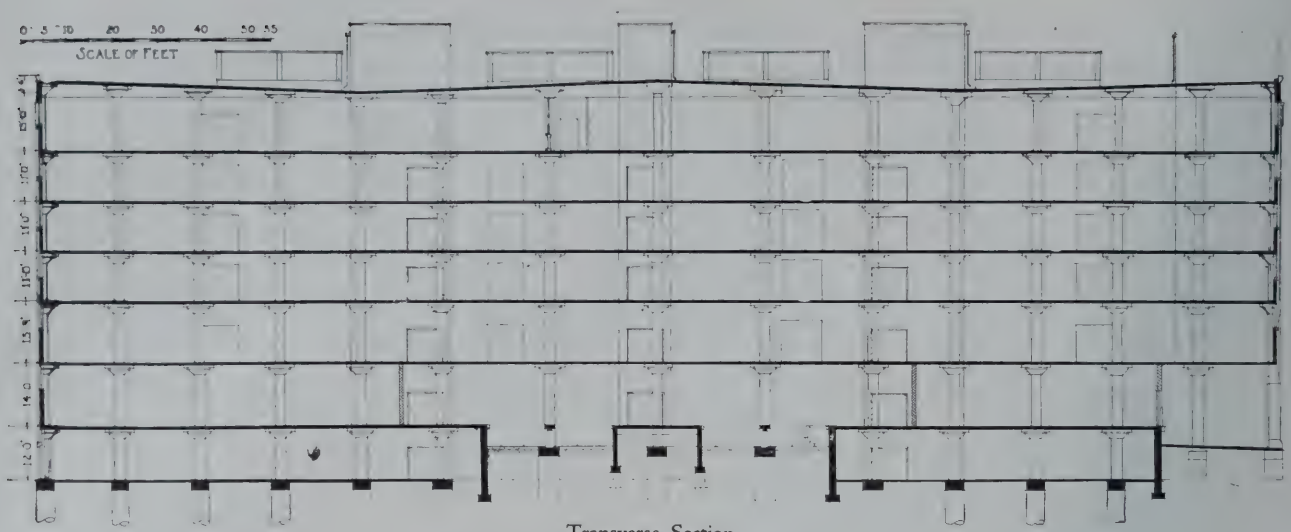
Just to the north of the Union Stock Yards lay a tract of some 300 acres which was unimproved and, with the exception of a few dilapidated lumber yards scattered along the South Branch of the Chicago River, was devoted to the cultivation of cabbages. It was an uninviting prospect and a keenly prophetic vision was necessary to see in it a future which would make justifiable the tremendous effort necessary to put it into attractive condition. However, the farsighted men who were guiding the interests of the Chicago Junction Railway had the requisite degree of confidence in Chicago's industrial growth and were prepared for the test of this idea. Accordingly, there was bought practically all of the land lying between Morgan street and Ashland avenue and stretching from 35th street south to 39th street.

The acquisition of this property dates from 1902. It was purchased outright from the various holding interests by men who were likewise financially interested in the Chicago Junction Railway and Union Stock Yard & Transit Company. In 1908 active development of the Central Manufacturing District was begun. Many thousands of dollars were expended on improvements which included pavements and sewers. Industries began to drift into the District, slowly at first but increasing in number, until at present it accommodates a total of some 200 industrial residents.

To the south and west of the Central Manu-

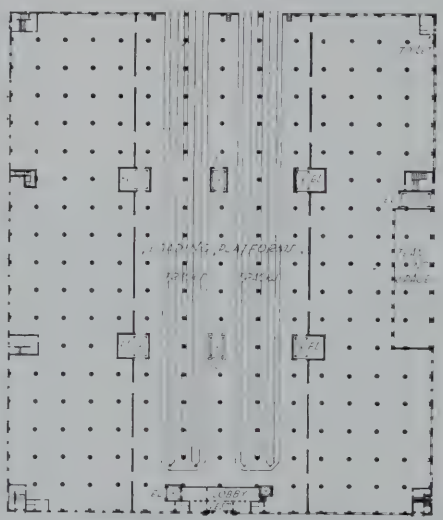


The Montgomery Ward & Company Warehouse



Transverse Section

facturing District lay another tract of waste land, about 100 acres in extent, stretching west from Ashland avenue to Western avenue and south from 39th street to the branch of the Chicago River generally known as Bubbly Creek. In 1916 the trustees controlling the development, having acquired this acreage, proceeded with its improvement. Bubbly Creek, which for years had been an eyesore to Chicago, was filled and replaced by a large sewer line, thus increasing the value of the land, and



Ground Floor Plan of One Unit

making it desirable as an industrial location with direct connections to the Ashland avenue yard of the Chicago Junction Railway.

Most of the buildings which house these industries have been erected since active development was started. The total cost of improvements and building operations amounts approximately to $30,000,000. Of this large figure $18,000,000 represents the aggregate expenditures by the trustees to cover the making of streets, erection of buildings and other

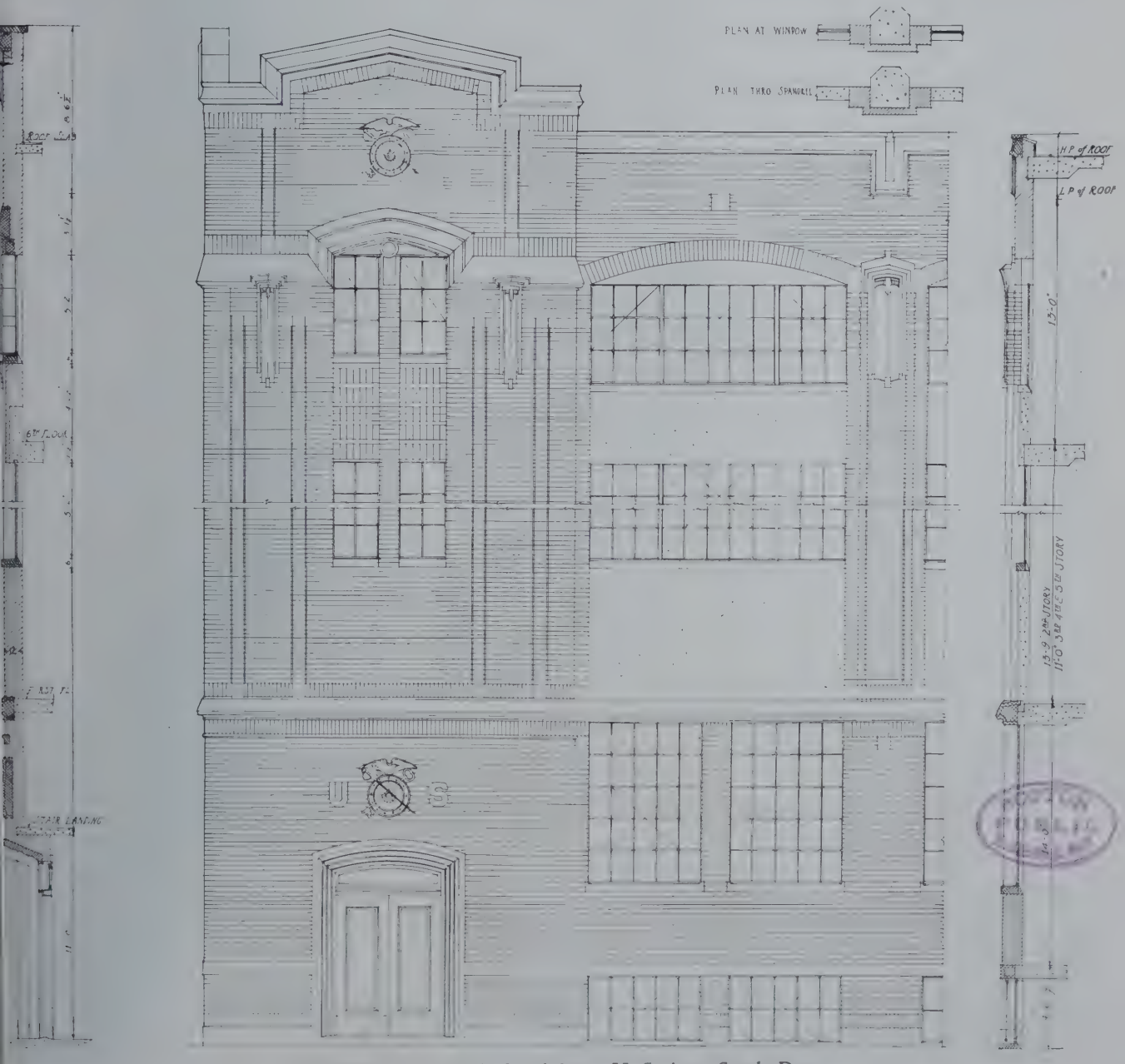


U. S. Army Supply Depot before Construction of Third Block

improvements for industries under various agreements which have been made.

The value of the location depends chiefly upon excellent transportation. Each building has its own switch track. This track need not be utilized only for carload shipments; on the contrary, less than carload shipments may be loaded at the very door of a factory building and thus the necessity for vehicle transportation either wholly obviated or greatly reduced. This is accomplished through the agencies of union freight stations and trap car service. Freight loaded out is dispatched the same day, carloads for the respective carriers being extracted from the station settings by their own locomotives. All inbound freight and carloads inbound are handled to and from industries at the through Chicago rate. The Chicago Junction Railway method is peculiar in that each day is a time unit to itself. Each day's business is handled during that day and the next begins a clean slate. Efficiency and system make possible the entire clearing of the congestion in the freight yards once every 24 hours; in this way the accumulation of shipping is impossible. This is due to the fact that the carrying facilities are controlled by the District authorities, which means that transportation problems are so handled that delay and friction are unknown by District manufacturers.

Aside from its unusual advantages in the way of railroad facilities, the District is fortunate in its being within a convenient distance of residence neighborhoods which are suitable for the homes of the vast number of employes needed for such a business development. Within 4 miles from the center

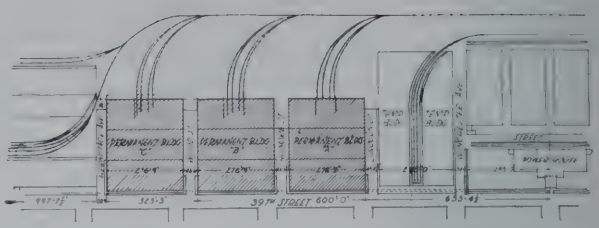


Wall Sections and Detail of End Bays. U. S. Army Supply Depot

of the Central Manufacturing District dwell somewhere between 1,000,000 and 1,500,000 people. A recent survey has proved that of this number about 40 per cent are male adults and 36 per cent female adults. Something like 52 per cent are Americans and the remainder are variously proportioned between a dozen other races. These workers can reach the District by through or cross-town lines on several streets.

The District offers a variety of community features. It is served by a bank under state supervision, which is one of the most complete outside of the Chicago loop. There is a club in which District residents have membership and which has all the attractions of any similar organization. In the District are branch offices of the express and telegraph companies, which give immediate service. The District surgeon and his staff are fully equipped to take care of workers who suffer accidents, and an ambulance is in readiness for use, if necessary, at any hour of the day. There is supported a traffic bureau the duties of which are to aid shippers and to help in the solving of traffic problems.

The matter of financial agreements between the management and industries locating in the District is, of course, of great importance. Several forms of contract, varying in nature, have been adopted so that to each individual industry can be submitted the plan which it and the trustees consider most favorable. Some industries are fully prepared to take care of their own finances and prefer to buy outright. Others, which have no financial reserves established, prefer a long term lease arrangement with the privilege of an option on their property. The trustees fully appreciate the problems of young and growing industries and are generous in their terms with them.



Plot Plan Showing Location of Present Three Blocks of Army Supply Depot

There are three financial arrangements which cover all requirements well. The trustees will sell the land outright and erect a suitable building for an industry, or they will lease the ground and erect a building, and the industry then has to pay the charges in the form of annual rent for 25 years, the period for which the lease is written, this rent being figured on a basis of 6 per cent on the value of the ground and 9 per cent on the value of the buildings and improvements. Probably the most popular form of agreement is what is known as the "Contract of Purchase." Under this arrangement the trustees will sell the land and erect a building for an industry which has to pay a certain percentage of the total, usually 25 per cent, in cash and the remainder in the form of annual rental, spread over a term of 10 or 15 years, with interest on the unpaid balances. The trustees naturally do not wish to locate an industry which is not financially capable of discharging the responsibilities incident to a location in the Central Manufacturing District. Like all good propositions, it has nothing cheap about it. The advantages claimed for the District are evident and they fully justify the investment required. They are also interested as much now as originally in securing industries of which the production will be sufficient to materially add to the tonnage of the



Typical Central Entrance of Quartermaster's Department



PRINCIPAL STREET FACADE



UNITED STATES COLD STORAGE BUILDING, CENTRAL MANUFACTURING DISTRICT, CHICAGO

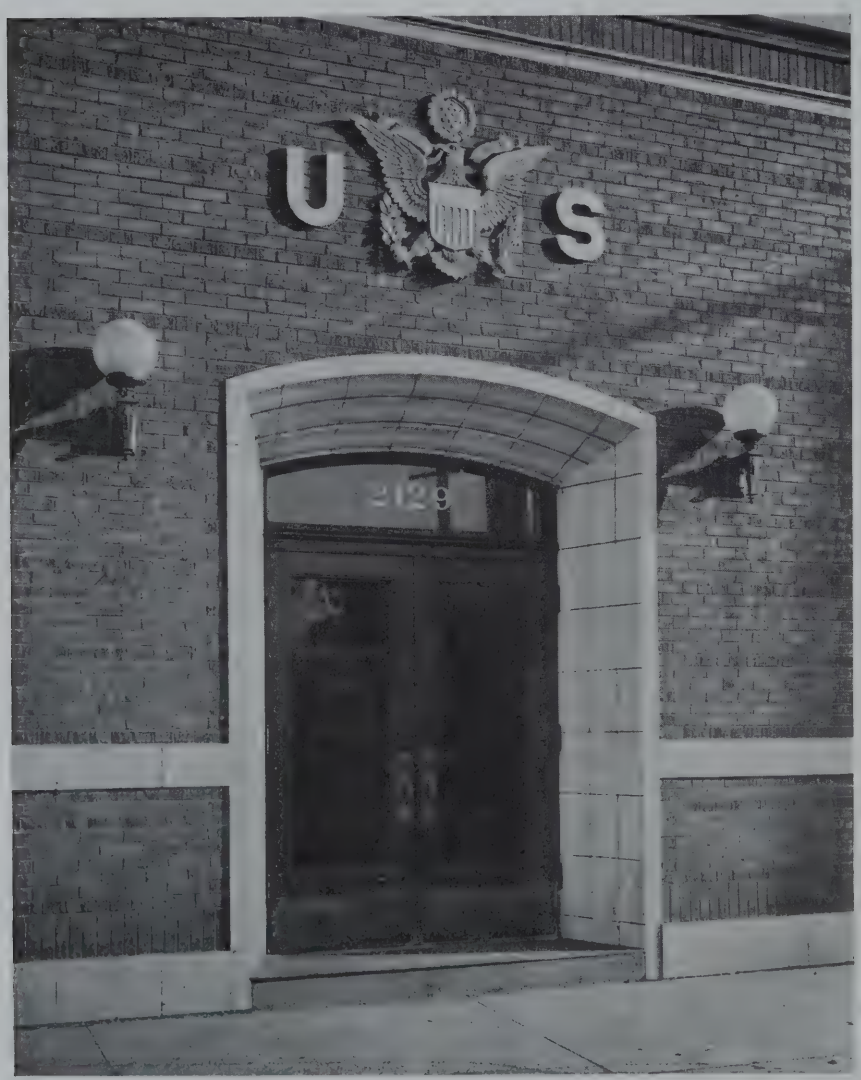
S. SCOTT JOY, ARCHITECT

Chicago Junction Railway, whether in carload or less than carload freight.

From the manufacturer's standpoint, the problem of financing centers chiefly around the improvement in his business prospects resulting from the advantages he secures through his location in the District. If his business has been established for a long period of years, and he has been able to lay up a surplus for the purpose of investing in a new site and building, he finds the "Contract of Purchase" plan the most economical and profitable. On the other hand, if his business is in process of building and he needs its income to help its growth, the lease plan is decidedly more favorable. Most manufacturers, of course, are endeavoring to build up permanent commercial structures. They see in settling in the District a chance to give their businesses naturally healthy growth which is bound to come with the best available modern manufacturing and shipping facilities, and with this growth they foresee a further opportunity to introduce permanence by discharging the responsibility incurred in buying their respective locations.

The District is adapted for the manufacture of practically any product. In Chicago there are more than 11,000 manufacturing plants. This fact is an indication of the unexcelled advantages to be had here. The argument which applies in the case of Chicago as a location, applies equally to the Central Manufacturing District, and in some respects the District has additional advantages. There are no restrictions to exclude certain lines of business from the District, but the trustees, with an eye to the interests of residents already located, are adverse to negotiating with concerns the business of which would endanger the interests of others already established.

The entire District organization is trained to exert itself toward the maintenance of mutually agreeable and helpful relations. The management has continually in mind the necessity for co-operation between the residents in this community and between the residents and the trustees. The policies of the trustees are liberal, and consistent effort is made to assist the industries in any possible way for promoting efficiency.



Entrance Doorway, U. S. Cold Storage Building

In the contracts with the United States government, through which resulted the new permanent Army Supply Depot, the trustees acted as general contractors. The government purchased altogether approximately 750,000 square feet of land, having a frontage of 1525 feet on 39th street with a 500-foot depth. This ground was utilized by the government for the erection of three great permanent warehouse units and the largest cold storage plant in America. The building of this plant was approved by the War Department upon the condition that should it be decided at the close of the war that it was not required, the trustees would re-purchase it from the government at a price to be fixed by appraisal. The early termination of the war caused the government to abandon this project, and in accordance with their agreement the trustees took over the cold storage warehouse, giving the government in return the third permanent warehouse unit and a cash sum to make up the total of the storage plant's appraised value.

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Steel Construction

PART I. GENERAL CONSIDERATIONS

By CHARLES L. SHEDD, C.E.

THE use of steel beams and columns was developed when it became necessary to erect larger structures than could be built with wood construction, in which solid wood and masonry would take up too much room. Before the steel beam became a commercial possibility, wrought iron beams had been in use. Wrought iron was not as strong as steel, but the passing of time has demonstrated that it had qualities that do not exist in steel. It does not deteriorate nearly as fast from moisture and therefore, in some classes of work, has a much longer life.

These beams were at first merely used in floors to span between walls, and usually brick arches were formed from beam to beam. Then it was found that one beam could be framed to another by the use of connection angles fastened to their webs. This permitted framing around stairways or other openings in the floors. The next were used as compression members; that is, as small struts in the interiors of the buildings. The sizes of these struts were increased until large columns were made capable of carrying even the outside walls, as may be seen by reference to the illustrations. Some of these columns carry millions of pounds. By using columns in the outside walls it was possible to make the walls themselves quite thin, in fact no thicker than would be necessary for a one-story building, and on tall buildings much greater speed could be made in construction as the steel frames could be erected rapidly and with very little temporary bracing, so that it was possible to start a separate gang of masons on each floor to build the walls resting on the beams, just as if each story were a separate building. As a matter of fact, in practice the masons do not start with a separate gang on each floor but often start several gangs on floors six or seven stories apart, and each gang works up until it reaches that working next above.

Between these beams various kinds of material are used for the floors, including wood for non-fireproof buildings, and for fireproof buildings brick and terra cotta arches, reinforced concrete and various patented materials such as gypsum.

Under the columns bases are constructed to distribute the loads to the foundations. Small steel bases, built with the columns themselves, are used for the smaller loads, cast iron for larger loads and cast steel for still larger loads. The foundations are usually made of concrete and when these bases are not large enough to distribute the loads over sufficient areas of concrete, steel beams are placed in layers under the bases to increase the foundation areas. These grillage beams are used to a large extent to distribute the loads over sufficient areas so that the soil will not be over-stressed, but with the increased use of reinforced concrete such beams have largely disappeared from use. Some 20 years ago a stone block was used between the cast base and the concrete, but its use has been given up almost entirely.

In Fig. 1 are shown various steel shapes. A is known as the I beam; W is the web; F the flange, and f the fillet. The principal work done by a beam is to resist bending. The most of this is resisted by the flanges while the web resists shear, principally. Hence the web is made as thin as possible to resist this shear and still be strong enough to prevent buckling from the compressive strains. The flange is designed to be sufficiently wide to resist compression. B is known as the channel and is about the same as half of an I beam. This section can be used better than the I beam in some places, such as around stair and elevator openings, in spandrel sections, to carry hangers, and to make columns and compression chords of trusses. C is an angle section with the two "legs" of equal length. It can be used for lintels, spandrel sections, shelf angles, connections of beam to beam and for columns. D is another angle with unequal legs. E is the T section. It is used for small struts and occasionally for lintels.

F and G are Bethlehem sections. F is a girder beam and G the H column. F is the same as A excepting that it is a newer style and made only by one company. Its difference consists in having a broader flange. This makes it stronger in bending; that is the flange is larger in proportion to the web than is the case with the ordinary I beam. The manufacture of these beams was made possible by a new process. In the rolling of the ordi-

nary beam and channel a large piece of red hot steel is passed between two rolls which roll against the webs, the ends of these rolls pressing against the flanges. Outside the flanges are stationary guides against which the metal squeezed out from the rolls is pressed and then forced out between the ends of the rolls and the guides until the flange is formed. To get the best results it is only possible to force the flange out to a limited distance as this metal, not being rolled, would not be as dense as the web which had been compressed between the rolls. In the Bethlehem process the guides outside the flanges are replaced by rolls revolving at right angles to those rolling the webs, thus shaping and condensing this material.

placed first. It has been suggested that it would be an improvement on this practice if the lengths of the legs were placed in such order as to show which way they turned. The first might be the horizontal leg, or in the case of a vertical section it might be the outstanding leg. This appears to the author to be a good suggestion if it could be universally adopted. Ts are marked as "3″ x 3″ x 6.8# T," the first two figures being the width of flange and depth of stem respectively, and the last the weight in pounds per lineal foot. Here the decimal must be used as the weight varies from the halves and quarters. The thickness of the metal is not given, as in the case of angles, as the stem bevels considerably being thinner at the end than

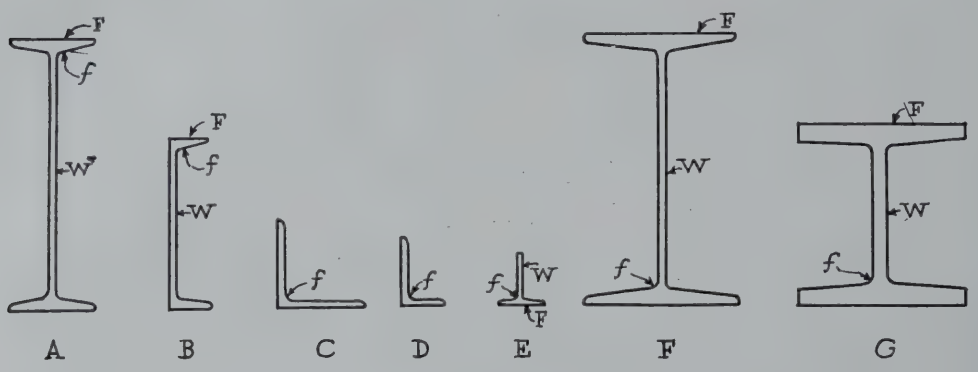


Fig. 1

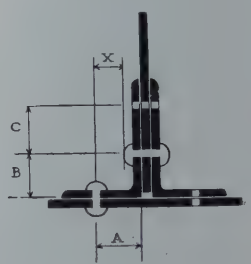


Fig. 2

G is the Bethlehem H section which is made in the same way as their I beams, but is made with the depth about equal to the width of the flange. These sections are used as columns in competition with the ordinary plate and angle column. Besides these shapes there are the flat plates, the round rods and the square rods. The plates are used in plate girders, trusses, columns and for reinforcing and connecting beams. The rods are used as hangers and as reinforcing material in concrete.

In designating the different shapes certain conventional methods have been adopted. For I beams it is customary to mark one such as a "12″ I 31½#." The 12″ is the depth of the beam, that is from out to out of flanges, while the 31½# is the weight in pounds per lineal foot. It seems preferable to put the I between the two numbers to separate them rather than to place it at the end as some do. The fraction, rather than the decimal, is also preferable on plans where a decimal point is not altogether desirable. The channels are marked similarly as "15″ [33#." It is frequently written so that the sign for the channel shows which way it is intended that the channel should turn when in place in the building. Angles are designated as "6″ x 6″ x ¾″ L" or "5″ x 3½″ x ⅜″ L." The first two figures represent the length of the legs on the outside of the angle and the fraction at the end shows the thickness of the legs. When the legs are of unequal length the greater is it is up against the flange. Bethlehem beams are marked "15″ BI 38#" or "24″ BG 120#" as in the case of the standard I beams. "BI" stands for Bethlehem I beam and "BG" for Bethlehem Girder beams. The catalog divides the beam sections into these two classes, the larger beams being known as girders. The H columns are designated as "14″ BH 170.5#." The 14″ is the approximate depth of the section. These vary considerably in actual measurement from the lightest section to the heaviest, due to the method of manufacture. The same rolls are used for several different weights, but are spread farther apart for the heavy weights. This is true of the standard shapes also, but as the guides for the flanges are stationary or fixed for the different weights the depths do not vary. Since the manufacture of these Bethlehem shapes began the Carnegie Co. has begun the manufacture of some new I beams to compete with them, and some small H sections smaller than those made by the Bethlehem Co. Plates are marked as "16″ x ¾"," the first being the width and the last figure the thickness. It is usual to use as the width, not the smallest dimension but that from which the plate would probably be cut. This of course would be as near even inches as possible.

These different pieces of steel are fastened together by bolts or rivets. Rivets are used in any work of importance, as they are stronger and less



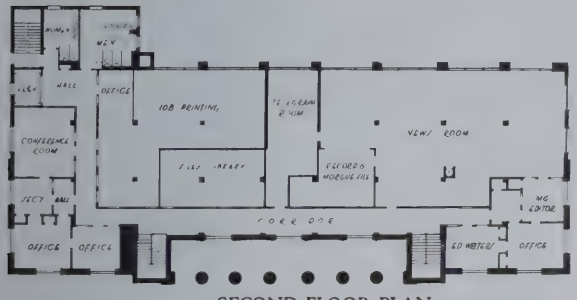
PORTICO ON MAIN FACADE

BUILDING FOR *THE HARTFORD TIMES*, HARTFORD, CONN.

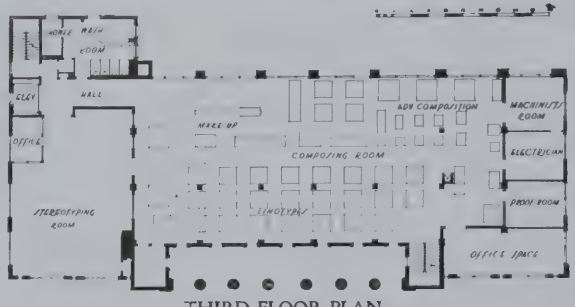
DONN BARBER, ARCHITECT



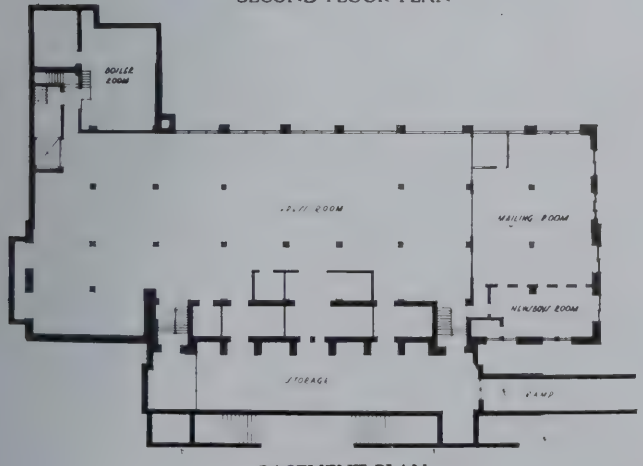
DETAIL OF MAIN FACADE



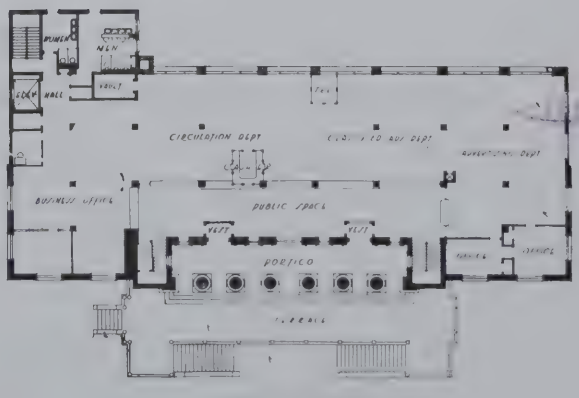
SECOND FLOOR PLAN



THIRD FLOOR PLAN



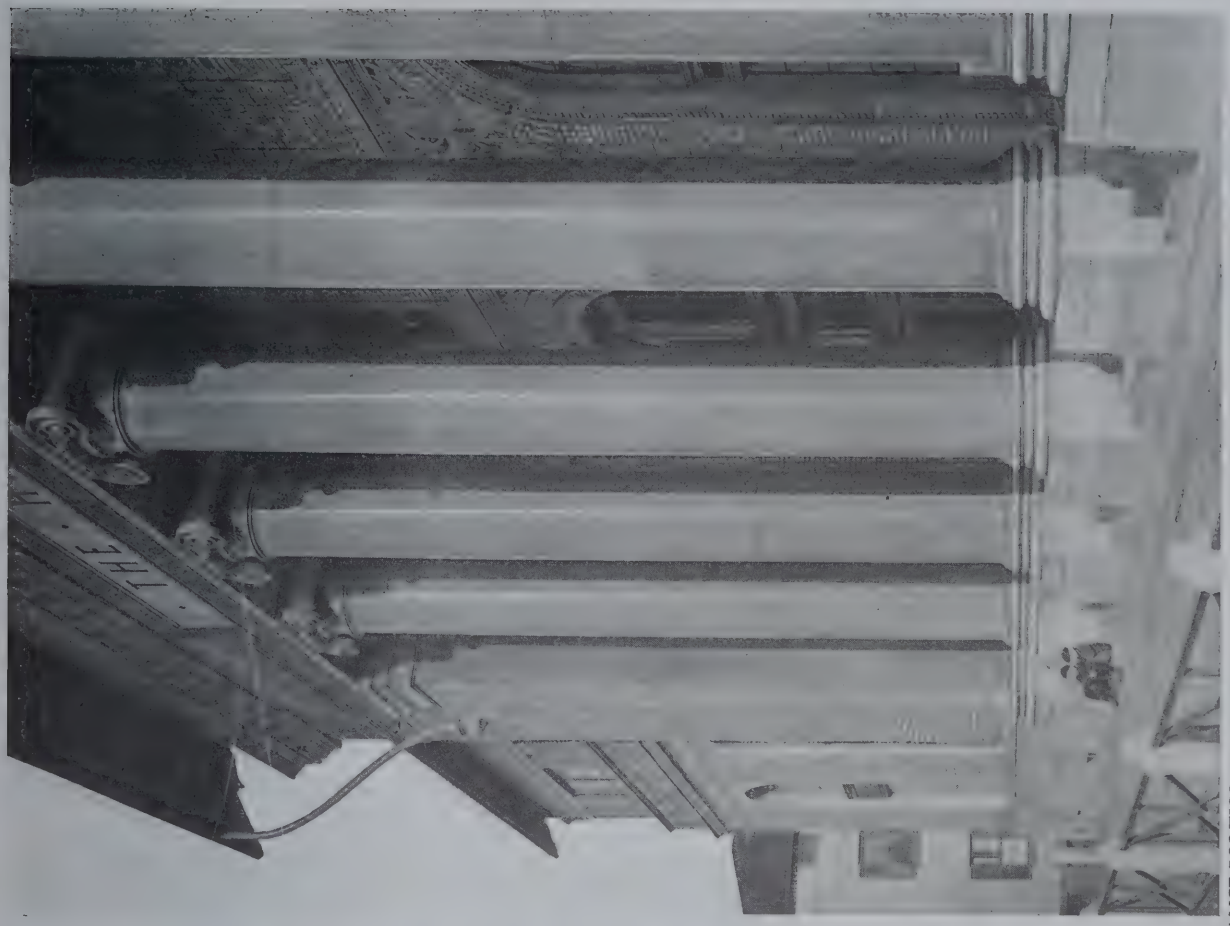
BASEMENT PLAN

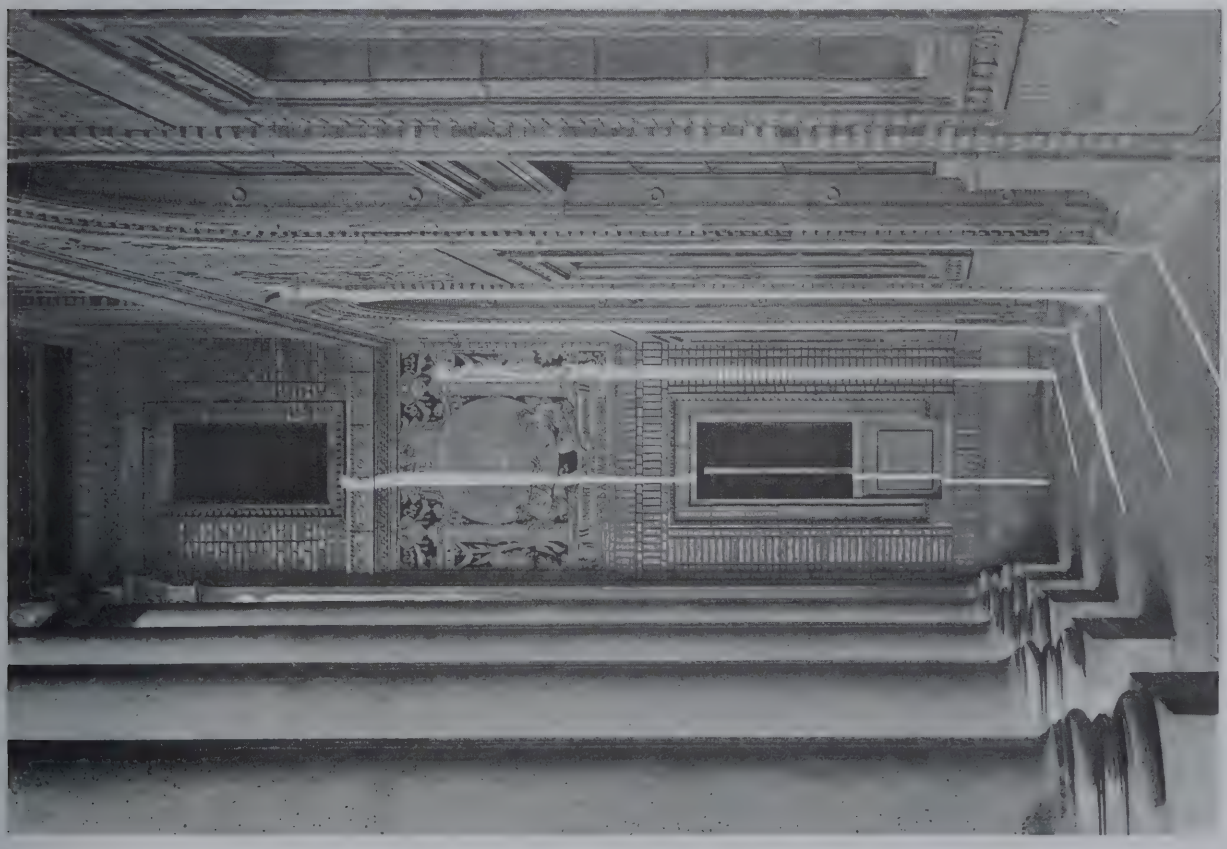


FIRST FLOOR PLAN

BUILDING FOR *THE HARTFORD TIMES*, HARTFORD, CONN.

DONN BARBER, ARCHITECT





DETAILS OF ENTRANCE PORTICO

BUILDING FOR *THE HARTFORD TIMES*, HARTFORD, CONN.

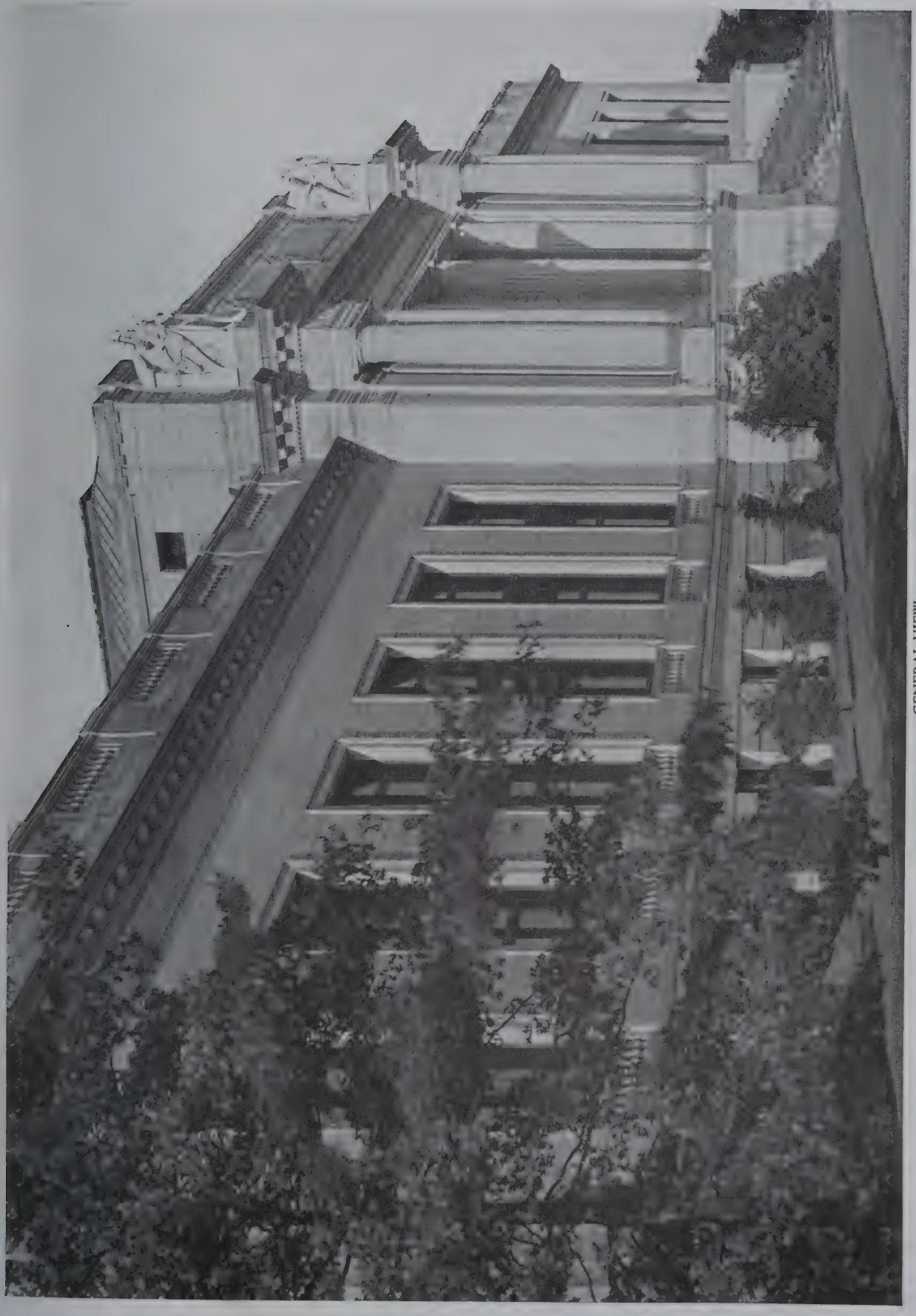
DONN BARBER, ARCHITECT



VIEW OF TOWER

BUILDING FOR THE TRAVELERS INSURANCE COMPANY, HARTFORD, CONN

DONN BARBER, ARCHITECT



GENERAL VIEW

CONNECTICUT STATE LIBRARY AND SUPREME COURT BUILDING, HARTFORD, CONN

DONN BARBER, ARCHITECT



DETAIL OF ENTRANCE HALL



DETAIL OF COURT ROOM

CONNECTICUT STATE LIBRARY AND SUPREME COURT BUILDING, HARTFORD, CONN.

DONN BARBER, ARCHITECT



DOORWAY IN COURT ROOM

CONNECTICUT STATE LIBRARY AND SUPREME COURT BUILDING, HARTFORD, CONN

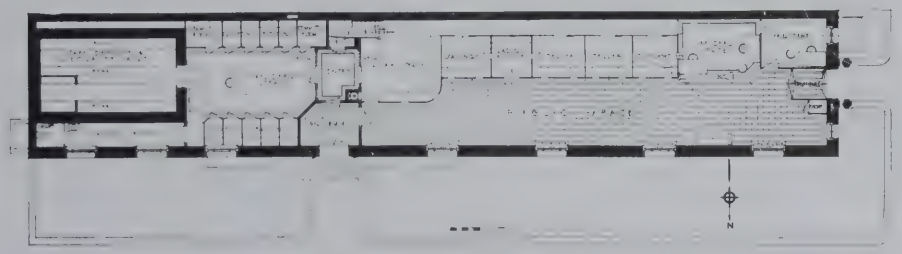
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GENERAL VIEW



MEZZANINE FLOOR PLAN



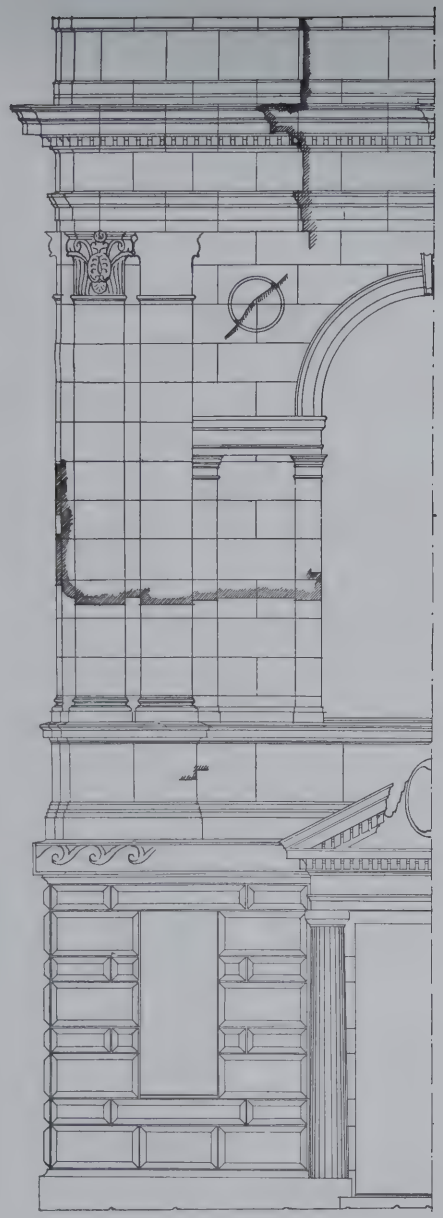
FIRST FLOOR PLAN



VIEW OF BANKING ROOM

LIBERTY NATIONAL BANK, WASHINGTON, D. C.

HOLMES & WINSLOW, ARCHITECTS





EXTERIOR AND INTERIOR DETAILS OF FRONT WALL



VIEW OF MAIN FACADE

LIBERTY NATIONAL BANK, WASHINGTON, D. C.

HOLMES & WINSLOW, ARCHITECTS

liable to loosen. When the rivet is placed in the hole it is red hot, with one head already formed. When the other head is formed the rivet is so compressed that it expands until it completely fills the hole. If the rivet is not sufficiently heated or properly driven, a competent inspector on the work would reject it, cause it to be removed and driven over again. In building work rivets are usually ¾ inch in diameter. In the flanges of beams less than 8 inches deep and in angles where the leg is less than 2½ inches a smaller rivet must be used such as ⅝- or ½-inch. In very heavy construction rivets of ⅞-inch size or occasionally even larger are used.

In the mill, the beams, etc., are rolled in long lengths and afterwards sheared into the desired lengths. The edges of the metal are therefore classed in two divisions—rolled edges and sheared edges. As the rolled edge is much more accurate than the sheared edge, rivets can be driven nearer to it than they can to the sheared edge. With rivets it is common practice to use minimum distances from the center of the rivet to the rolled edge; the custom with ¾-inch is to use 1⅛ inches for rolled edges and 1¼ inches for sheared edges. More conservative engineers use 1¼ and 1½ inches respectively. In Fig. 2 is shown the lower flange of a plate girder. It shows the lower part of the web plate, the two flange angles, a flange plate and the rivets to fasten them together. This will illustrate the placing of rivets in angles. We will assume that the usual ¾-inch rivets are used. In order that the rivet may be properly driven the distance X must not be too small when the rivets come opposite each other. This distance should not be less than 1⅛ inches for ¾-inch rivets.

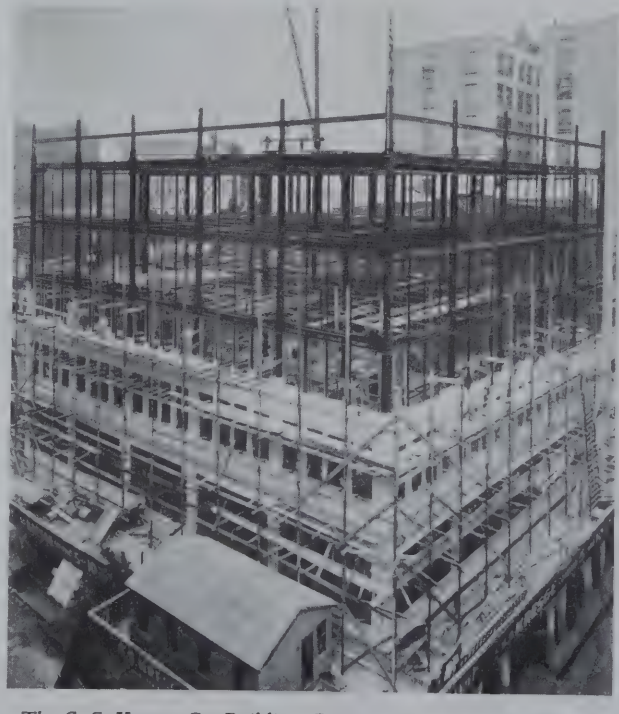
For convenience certain standard distances have been adopted for different sized angles for the distances A, B and C. These distances are called gauges. For legs 4 inches or less one gauge line, that is the distance A, is used. For a 2½-inch leg the gauge A is 1⅜ inches; for a 3-inch leg, 1¾ inches; for a 3½-inch leg 2 inches, and for a 4-inch leg 2½ inches. In a 5-inch leg two gauges are generally used but C is so small that the rivets should not be driven opposite each other. This is not on account of its not being possible to drive them but because there would be so little metal left between the holes that the strength of the angle would be too greatly impaired. B is 2 inches and C 1¾ inches. Sometimes only one gauge line is used, and when such is the case A equals 3 inches.

In a 6-inch leg B is 2½ inches and C is 2¼ inches. If the thickness of the angle is not too great these dimensions are sometimes reversed, and in some cases B is made as small as 2 inches when the stresses are such as to cause a bending on the angle which can be held more firmly by a small gauge. In an 8-inch leg B and C are both 3 inches. In some cases three gauge lines are used for angles not too thick; under these conditions all three distances are made 2¼ inches.

As was noted in the case of the 5-inch legs, the rivets cannot be too close together on account of weakening the angle or plate too much. It is usual to make this distance not less than 2¼ inches. When possible it is good design to keep the distance 2½ or 3 inches. This distance is called the "pitch." In compression members the pitch should not be too great as the outside metal might buckle between the rivets. It is common practice to limit this to 6 inches. Some engineers, including the writer, limit it to 5 inches when the outside metal is only 5/16 inch thick. It is also advisable not to have the rivets too far apart in a direction at right angles to the stress. This is usually limited to 12 inches. Likewise, the distance from the rivet to the edge of the plate should not be too great in compression members. Eight times the thickness of the plate, and never more than 6 inches, is a common requirement.

In Fig. 3 is shown the top flange of an I beam. The distance from the top of the flange to the point where the fillet joins the web is known as the "k distance." When one beam is supported at its end by another, the first is usually "framed into" the second beam. When this is done they are generally connected on their webs by "connection angles." If the beams are flush on top or bottom the flange of the first would strike the flange of the second. Therefore, the flange of the first, with a portion of the web, has to be cut off. This is known as "coping the beam."

If the top of the first beam is lower than the top of the second, by a distance less than k, a small



The S. S. Kresge Co. Building, Boston, is Typical Steel Frame Construction, Referred to in this Series of Articles

Newhall & Blevins, Architects
Charles L. Shedd, Engineer

cope must be made, but if the distance is greater than k no cope is necessary. The coping is an appreciable proportion of the cost of "fabrication" of the steel therefore, if it can be avoided without causing an equal additional cost in the building, a saving may be easily effected. In many cases another form of connection may be used, with no additional cost or inconvenience, if the designer will bear in mind the resultant economy.

The connection angles have been standardized and are universally employed where no special

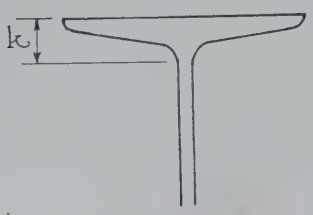


Fig. 3

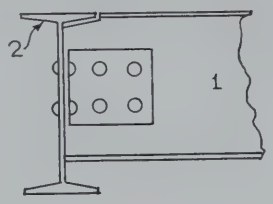


Fig. 4

conditions are required. There are, however, two standards, known as the old and the new. The new type is not as strong as the old as a new consideration has been taken into account in its design. This is in computing the bearing of the rivets on the web of the first beam. As this web is between the two connection angles, it is known as an "enclosed bearing," and has been computed to resist greater stresses than heretofore. Besides this, no account has been taken of the bending moment. There seems to be no doubt as to the propriety of considering the "enclosed bearing," in the writer's opinion, but the neglect of the moment appears to be worthy of serious consideration. That there is a moment no one would deny. As there is such a moment it must be resisted in some way. This may be done in either of two ways if it is not figured on the rivets. One way is by friction between the angles and the web of the first beam; the other way is by tension on the heads of the field rivets passing through the angles and the web of the second beam. It has never been considered good practice to consider either friction or tension on the heads of rivets and the writer would be very reluctant to do so. He therefore feels that unless a special investigation were made of the specific case, using the old recognized rules of computation for the stresses, it would be advisable to use the old standard beam connections.

In Fig. 4 is shown a 10-inch beam, framing into a 12-inch beam with the old style standard connection. They are shown framing flush on top with the top of the first beam coped. The two angles are each 6″ x 4″ x 7/16″, and 5 inches long. The four rivets connecting them to the first beam are driven in the shop. There are four rivets in the 4-inch legs of the angles, two in each angle. These are driven in the field, that is on the site of the building during erection. In all structural work it is important to have the field-driven rivets as few as possible. This is to effect economy and to save time; besides, a shop-driven rivet is driven under more ideal conditions and is less likely to be faulty. This distinction is not so important as it was before the time when power came into general use for driving field rivets. On small jobs, power is not now used as a rule, the driving of the rivets being done by hand. At the present time the mechanics doing this work do not appear to be as skillful or as careful as they were years ago. This often results in loose heads, in rivets not completely filling in the holes, and in the heads not being concentric with the stems.

It is sometimes desirable to hang a portion of one floor or a stair landing from the floor above. A hanger of a given strength takes up less room than a strut of equal strength, as the strut must have some considerable breadth in all directions to avoid buckling. A convenient method of forming a hanger is to use a narrow plate and rivet it to the back of a channel above and below. If a channel is not strong enough, two channels may be used and the plate or a round rod installed to pass between them. Sometimes the rod may be flattened out and this flat portion riveted to the channel. It is best not to attempt to flatten both ends of a rod with rivets as it is more difficult to make the adjustment accurately. Sometimes two angles are riveted to the back of a channel and the rod passed up between them. The angles can be made so that at the top of the rod they are flush on top with the channel and the nut on the rod will rest partly on the angle and partly on the channel. A bolt may be put through the two angles to hold the rod snugly against the back of the channel.

Another kind of hanger is formed by bending the plate at the top and, with a second short piece riveted to it, to form jaws engaging the flange of an I beam. This is not a good method to use where the load is of any considerable amount, as its strength is limited to the resistance of the plates to straightening out. It is used principally for hung ceilings. Sometimes these plates are extended upwards until they can be riveted to the web of the I beam, but that is not ideal as the plates are liable to straighten out somewhat, throwing the hung portion out of adjustment. Another form of hanger is made by slotting the flange of the beam and passing the hanger through this slot and riveting it to the web of the beam. This is an expensive method and in any event can only be done toward the end of the beam where there is more material in the flange than is necessary to carry the stresses in tension. Rivets in the bottom flanges of beams also weaken the beams, sometimes materially.

Calculation of Stresses in Wood Trusses

By MILO S. FARWELL

IN a previous article in THE FORUM the graphic method of solving the problem of stresses in trusses was discussed, and the purpose here is to give design data for the use of the algebraic method. The Howe type of truss is used, as it is often employed for supporting roofs over structures of various types where the roofs are flat and almost symmetrical.

Mr. Farwell's article carries with it a story of interest to architects and engineers generally in indicating a method of truss figuring based solely on algebra. It is a method of long standing but is not used as frequently as the graphic method, particularly in the East. One reason for this is probably that the graphic method shows instantly any error by its failure to close. In the analytic method, however, despite the lack of graphic proof, it is easy to check all calculations so that the possibilities of error are negligible. The computations here given illustrate the method as employed by Mr. Farwell in his practice in Oregon. The formulae for the design data used have been taken from the work on "Roof and Bridge Trusses" by Merriman & Jacoby.—Editor's Note.

THE purpose here is to give design data for the calculation of the stresses in the various members of a wooden truss of the Howe type. This truss is in common use for the support of roofs over garages, dance halls and similar buildings, often supporting a ceiling load on the bottom chord.

For our present purpose we will choose such a truss as might be used to support a flat roof over a garage. The span of the truss is to be 80 feet, with eight panels of 10 feet. The height of the truss to be 8 feet. Fig. A is a diagram showing the center lines of the members and the panel loads to be applied at the panel points of the top chord. We will assume that the roof joists rest on purlins which frame on the top chord at each panel point. The bearing for the truss at L_0 is to be a masonry or concrete pier.

The solution of this problem will be made without the use of any kind of a graphical diagram and will be according to what is known as the chord increment method. This is done by finding the number of shear points on each side of the center line. If the truss has an even number of panels, one-half of the shear for the center panel must be used, thus: $\frac{1}{2}$ L_4 plus L_3 plus L_2 plus L_1 = total shear on one side of the center. L_1 is 3.5, L_2 is 2.5, L_3 is 1.5 and L_4 is 0.5.

The next step is to find the tangent and secant of the angle between the bottom chord and the end post at the joint L_0. After this, by the method of chord increment, find the horizontal component of the stress in the web member adjacent to the chord in question. As an example, the shear of the web member L_0-U_1 is 3.5. Multiply this by the value of tangent θ, and the result will be the increment of the chord stress. This multiplied by the panel load will give the actual stress at the joint L_1. The stress coefficient at the succeeding points is found by adding the stress of the previous member to the increment of the member in question.

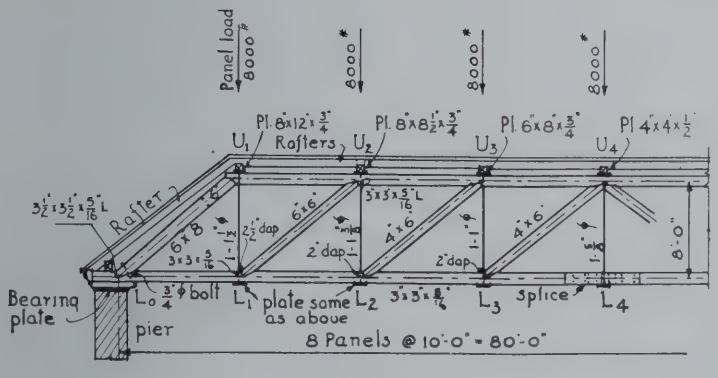


FIGURE A

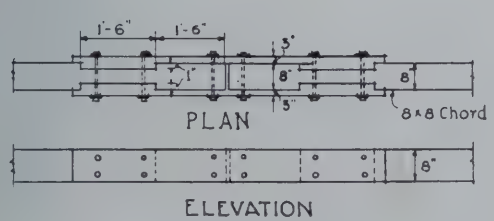
CHORD STRESSES

Member	Shear	increment	Stress	Actual Stress	Chord
L_0-U_1	3 5	2 8	2 8	22,400	U_1U_2 L_0L_1
L_1-U_2	2 5	2 0	4 8	38,400	U_2U_3 L_1L_2
L_2 U_3	1 5	1 2	6 0	48 000	U_3U_4 L_2L_3
	5	4	6 4	51,200	L_3 L_4

WEB STRESSES

Member	Shear	Stress	Actual Stress	
L_0-U_1	3 5	4 2	33600	Secant of Angle θ $\frac{12.8}{10}$ = 1.28
L_1-U_2	2 5	3 0	24000	
L_2-U_3	1 5	1 8	14400	
L_3 U_4	5	0 6	4800	Tangent of angle θ = $\frac{8}{10}$ = .8
U_1-L_1	3 5	3 5	28000	
U_2-L_2	2 5	2 5	20000	
U_3-L_3	1 5	1 5	12000	
U_4-L_4	5	5	4000	

FIGURE B



DETAILS of SPLICE

FIGURE C

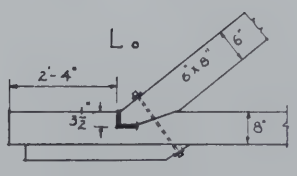


FIGURE E

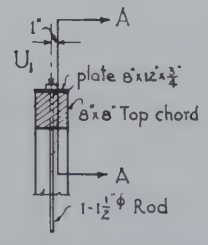


FIGURE D

The stress in the chords U_1-U_2 and L_0-L_1 = shear 3.5 times tangent θ (0.8) = 2.8 the chord increment. 2.8 times the panel load (8000 lbs.) = 22400, the actual stress. The stress in the next chord is found thus: multiply 2.5 by tangent θ (0.8) = 2.0 increment of chord U_2-U_3 and L_1-L_2. The stress in these chords is increment 2.0 plus the stress in chord U_1-U_2 and L_0-L_1 (2.8) = 4.8 stress in chords U_2-U_3 and L_1-L_2.

The stresses in the web members are found by multiplying the shears by the secant θ, thus for L_0-U_1, stress is shear 3.5 times secant θ (1.2) = 4.2, multiply this by the panel load, 8000 for the actual stress, which is 33600 lbs.

The accompanying table (Fig. B) shows the increments and stresses for all members.

Timber to be used #1 common rough Douglas fir
Allowable stresses,
1200 lbs. per sq. in. for tension
1200 lbs. per sq. in. for compression with the grain
300 lbs. per sq. in. for compression across the grain
200 lbs. per sq. in. for shear parallel to the grain
16000 lbs. per sq. in. for tension in steel

Compression formula for all members in compression:

$$\left\{\frac{1200\ (1-\text{Length of chord in inches})}{60 \text{ times depth of chord}}\right.$$

Design of Members. The joint L_0 is designed without the use of a steel shoe. This is the most economical detail for a wooden truss, but can only be used where there is sufficient end distance. In many cases it is necessary to use a steel shoe on account of the end of the truss coming inside of a wall.

The bottom chord is shown with a splice. Securing a timber 84 feet long is usually difficult, so a splice should be used as shown.

The size of the bottom chord has been increased over the size required for the stresses so the splice will develop full strength.

Refer to figure C for details of the splice.

Lower chord $L_3 - L_4$ stress = 51200 lbs.

$\frac{51200}{1200}$ = 42 sq. ins. required

6″ x 8″ timber is O. K.

Upper chord $U_3 - U_4$ stress = 48000 lbs.
by compression formula,

$1200\ (1 - \frac{12 \times 10}{60 \times 8}) = 900$ lbs. per sq. in.

1 — 8″ x 8″ = 64 sq. ins. section

64 times 900 = 57600

8″ x 8″ is O. K.

End Post $L_0 - U_1$ stress = 33600
by compression formula,

$1200\ (1 - \frac{12.8 \times 12}{60 \times 8}) = 816$

1 — 6″ x 8″ = 48 sq. ins. section

48 times 816 = 39168

6″ x 8″ is O. K.

Rods

U_1 and L_1 — stress 28000

$\frac{28000}{16000}$ = 1.75 sq. ins.

Use — 1–1½″ round rod
area — 1½″ round = 1.76 sq. ins.

$U_2 - L_2$ — stress

$\frac{20000}{16000}$ = 1.25 sq. ins.

Use — 1 — 1⅜″ round rod area = 1.49 sq. ins.

$U_3 - L_3$

$\frac{12000}{16000}$ = .75 sq. in.

Use — 1 — 1″ round rod area = .78 sq. in.

$U_4 - L_4$

$\frac{4000}{16000}$ = .25 sq. in.

Use 1 — ⅝″ round rod area = .30 sq. in.

Plates required for joints

U_1 and L_1 — stress 28000 lbs.

Refer to Fig. D

Bending Moment to be taken at AA 1″ from center

Compression wood at 300 lbs. per sq. in.

B. M. at AA = 300 × 3 × 1½ = 1350 lbs.

$\frac{.75 \times .75 \times 16000}{6}$ = 1500 lbs.

therefore use plate ¾″ thick

Area of plate = 8 × 12 = 96 sq. ins.

96 × 300 = 28800
Area O. K.

Use plate 8″ × 12″ × ¾″

Joint U_2 — L_2 — stress = 20000 lbs.

$\frac{20000}{300 \times 8}$ = 8.3 Make plate — 8½″

Area of plate — 8 × 8½″ = 68 sq. ins.

68 × 300 = 20400
Area O. K.

Use plate 8″ × 8½″ × ¾″

Joint U_3 — L_3 — stress — 12000

$\frac{12000}{300 \times 8}$ = 5 Make plate — 6″ long

Area of plate — 6 × 8 = 48 sq. ins.

48 × 300 = 14400
Area O. K.

Use plate — 6 × 8 × ¾″

Joint U_4 — L_4 — stress — 4000

$\frac{4000}{300 \times 4}$ = 3.3 Make plate — 4″ long

Area of plate 4 × 4 = 16 sq. ins.

16 × 300 = 4800
Area O. K.

Use plate 4″ × 4″ × ½″

Joint L_0 — stress from L_0 — U_1 = 33600

See Fig. E for Horizontal shear

$\frac{33600}{6 \times 200}$ = 28″ for end of chord

Depth of dap

$\frac{33600}{8 \times 1200}$ = 3.5 Make depth of dap — 3½″

Detail of splice for bottom chord, see Fig. C

Splice to be made between L_3 and L_4
at section AA

Net area of chord at AA
6 × 8 = 48 sq. ins.

Section is good for
48 × 1200 = 57600 lbs.

the 2 shear blocks at end of chord are good for
2 × 8 × 18 × 200 = 57600 lbs.
which is O. K.

MINOR ARCHITECTURE
EXEMPLIFIED IN MODERATE COST BUILDINGS

Innovations in Small Store Design

ILLUSTRATED BY THREE CANDY SHOPS IN BOSTON, MASS.

THERE are but few more interesting opportunities of giving a distinctive and highly decorative appearance to business quarters than are afforded in the designing and planning of soda and candy shops, tea rooms or luncheon rooms of the better class. The very purpose for which such quarters are to be used might be supposed to excuse the use of a certain degree of decorative treatment, which many conservative architects might consider unsuitable for business premises of most kinds, and this makes possible a gaiety of expression which would seem to be highly desirable in rooms of this sort.

The illustrations included here suggest the pleasing results which may be attained in work of this character. The designs of the most successful examples are comparatively simple, the aim being apparently to avoid ornament or decoration of any kind which is introduced purely for its own sake, and to rely, for decorative effect, upon well designed utilities and fittings and upon the use of materials in which excellence of texture, design or color is combined with necessary utilitarian qualities, and the results which good taste may secure in such work are surprising.

The Brunswick Shoppe, of which two illustra-



Detail of Fittings in Forward Part of Store at 306 Boylston Street
William Chester Chase, Architect

tions are given here, is a combination of soda and candy shop and luncheon or tea room. The space which has been devoted to the candy shop proper was until recently used as a florist's shop while the larger area, now arranged as a luncheon and tea room, was utilized partly as a store room and partly as a delivery room in connection with the hotel which occupies the premises. Between these two areas is placed one of the entrances to the hotel, but the adapting of part of the ground floor to a wholly different purpose has involved but little change in the planning of this street entrance and its stairway to the main floor above.



Floor Plan of Store at 306 Boylston Street
William Chester Chase, Architect

The walls of the candy shop are covered from the top of a dado to the ceiling with a scenery paper of brilliant coloring on a pale gray background and the necessary counters, show cases and other requisite fittings are of wood, painted white. The floors are laid with cork tiles in squares of black and gray. The tea room or luncheon room which, as may be seen by the floor plan, occupies considerable area, has been treated in a somewhat similar manner. Instead of using a scenery paper the walls from the dado to the rather low ceiling are covered with canvas upon which has been painted, in gorgeous coloring, the continuous landscape or garden scene which is a striking form of wall decoration. The windows upon two sides of the tea room are arranged with narrow valances and long straight draperies of gray blue, plain surfaced fabric with cream colored appliques, and the floor is covered with the same squares of black and gray cork tiling used in the candy shop. Necessary tables and chairs are of wood painted black, with simple decoration of bronze and the lighting fitments are of bronzed metal with figured cut glass prisms which lend to the tea and luncheon room a pleasing note of festive simplicity.

Another successful result, equally attractive but wholly different and secured by the use of other materials, is the candy and soda shop at the intersection of Beacon and Center streets in Brookline, a suburb of Boston. Here the requirements call for much less in the way of actual area and details of equipment than was true of the Brunswick Shoppe which has just been described, for in the shop which is under discussion the serving of luncheon and tea is either not done at all or else is of much less importance than the sale of candy and the serving of the usual soda and ices. The floors are of tile of plain colors in which are set inserts of blue, green and black. Walls are of scoured plaster having a slightly roughened surface.



Doorway and Show Windows of Store at 306 Boylston Street

Throughout this candy shop the woodwork of various kinds—wainscoting, counters, tables and chairs, together with built-in show cases, benches and other details—is of wood painted, with certain panels and other details polychromed in borders, swags or other motifs which seem to be in harmony with the generally Italian spirit of the setting. Against the painted plaster walls have been hung two modern Flemish tapestries in the soft greens and wood colors in which such tapestries are usually woven, and above the soda fountain and counter, serving to emphasize the decorative importance of what is the chief feature, is a

pleasing disposition of cut mirrors between columns which support a circular pediment in renaissance fashion. Added interest is conferred by the use of wrought iron lighting fitments, either suspended from the ceiling or fixed to the walls and having shades of decorated parchment to temper the brilliance of the electric lights. An examination of the floor plans of this shop will show that advantage has been taken of its corner location to arrange show windows upon the entire frontage on Beacon street and upon a part of that on Center street, while in the remainder of the wall space upon the side street are windows which light that portion of the shop where patrons are served at small tables. The width of the shop near the main entrance makes possible a built-in seat and several small tables down the center which add to the decorative interest of the shop and serve, at the same time, the convenience of patrons.

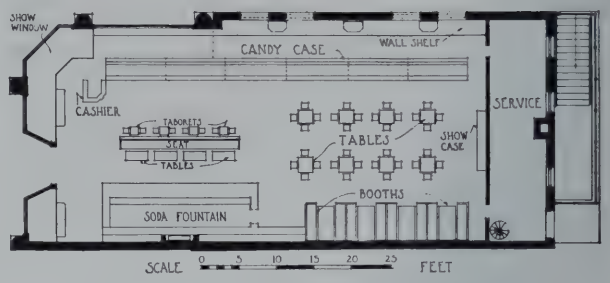
The attractiveness of another candy and soda shop, at 306 Boylston street, Boston, is due chiefly to the excellent taste with which the designing of the street front and the interior details have been treated, and the good judgment with which furnish ngs have been designed and color combinations selected. The front of the shop, as may be seen from one of the illustrations, has been given a very simple treatment in which marble, cast iron and glass are the principal materials, with wood used for doors. Within there exists sufficient well lighted area to make possible a somewhat unusual treatment, where in addition to the usual soda fountain and candy counters considerable space has been arranged with tiny tables, seating two or four, and a number of small alcoves or booths which consist of built-in seats or settles at the sides of small stationary tables which suggest the small "breakfast alcoves" which have become popular in city apartments and in small suburban or country houses.

In this shop the wall surfaces have been painted and then lined off with stone joints, the ceiling being left plain. The floors are paved with heather brown tile. Furniture, and the lower parts of such stationary fittings as cases, and the front of the soda fountain counter are of hard wood treated with mouldings and painted designs in the style of the Italian renaissance. Just back of the soda



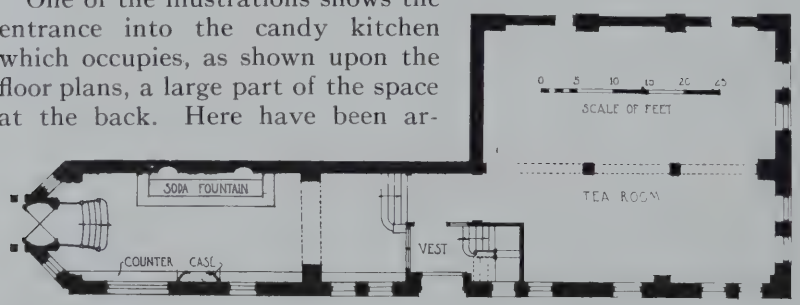
Space for Patrons and Service Door to Candy Kitchen in Store at 306 Boylston Street

fountain the wall treatment here takes the form of mirrors arranged in small panels surrounded by a painted frieze, pilasters and columns, and the central feature is an arrangement of cut mirrors surrounded by a broad border of painted decoration over which is placed a semi-circular painted panel. Parchment shades which are used to soften or tone the light from various hanging lighting fixtures suggest the design and repeat the colors used in the painted renaissance panels upon the counter and other stationary fittings. One minor detail, which adds much to the interest of this candy shop when seen from the sidewalk, is the use of black tiles, having soft, dull surfaces and laid in dark gray mortar, for the floors of the show windows. This background affords an excellent setting for the various objects likely to be placed in the windows of such a shop, a detail of considerable importance



Floor Plan of Candy Shop at Brookline
James Charles Flaherty, Architect

One of the illustrations shows the entrance into the candy kitchen which occupies, as shown upon the floor plans, a large part of the space at the back. Here have been arranged the various utilities, steam kettles, bake oven, gas range, mixing and moulding tables, and numerous other details required, while a portion of the area is arranged as pantry or serving rooms for the washing of dishes, polishing of glass and other uses connected with the work of a shop of this kind. In the case of the Brunswick Shoppe the service quarters are in connection with those of the hotel of which this shop is a part, and with that at Beacon and Center streets, which is really not a luncheon room, and where the wares sold are probably made elsewhere, very little in the way of actual service facilities is required.



Floor Plan of Brunswick Shoppe



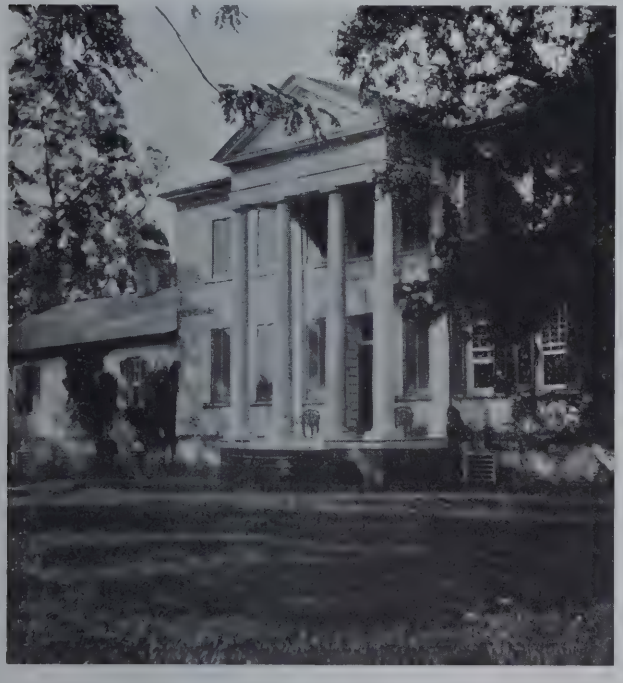
Soda Fountain and Tea Room Beyond in the Brunswick Shoppe
Blackall, Clapp & Whittemore, Architects

Details of Early Southern Architecture

TWO FAMOUS MANSIONS OF VIRGINIA

MEASURED DRAWINGS BY GODDARD M. WHITE

MODERN architects, and particularly many whose work is chiefly or largely of a domestic nature, sometimes turn for inspiration to American work of the eighteenth century. The architecture of many of these old houses, softened as it is by time, is quite as pleasing today as when they were built, and its suitability is much the same for these old houses were built for homes and the requirements of the American home, after all, have not varied greatly during two centuries.



The North Portico of "Sabine Hall"

Certain details—exterior and interior—are given here of Westover and Sabine Hall, two old houses which have played prominent parts in the social history of Virginia. In the case of Westover one of the chief points of interest is found in the accurate proportions of the facade, the lintel curve of the principal windows and the treatment of the main entrance. The doorway just dominates the elevation; if it were larger it would be too heavy, and if smaller this dominance would be lacking.

It should be an accepted theory that in the design of a colonial facade the main doorway, which is generally its chief architectural feature, should be just large enough to command, as it were, the elevation. Here the design is excellent; the start of the pediment is almost horizontal, then on either side the curve rises first slowly, then abruptly, ending in a spirited rosette of suitable size. The curves at no point become dead and the breadth of the pediment and the generous width of the space between the two give to the doorway an appearance of stability and dignity. The pediment of this main entrance at Westover is supported upon two fluted pilasters and before the entire doorway is a broad stone platform which is approached by steps returned against the house at either end.

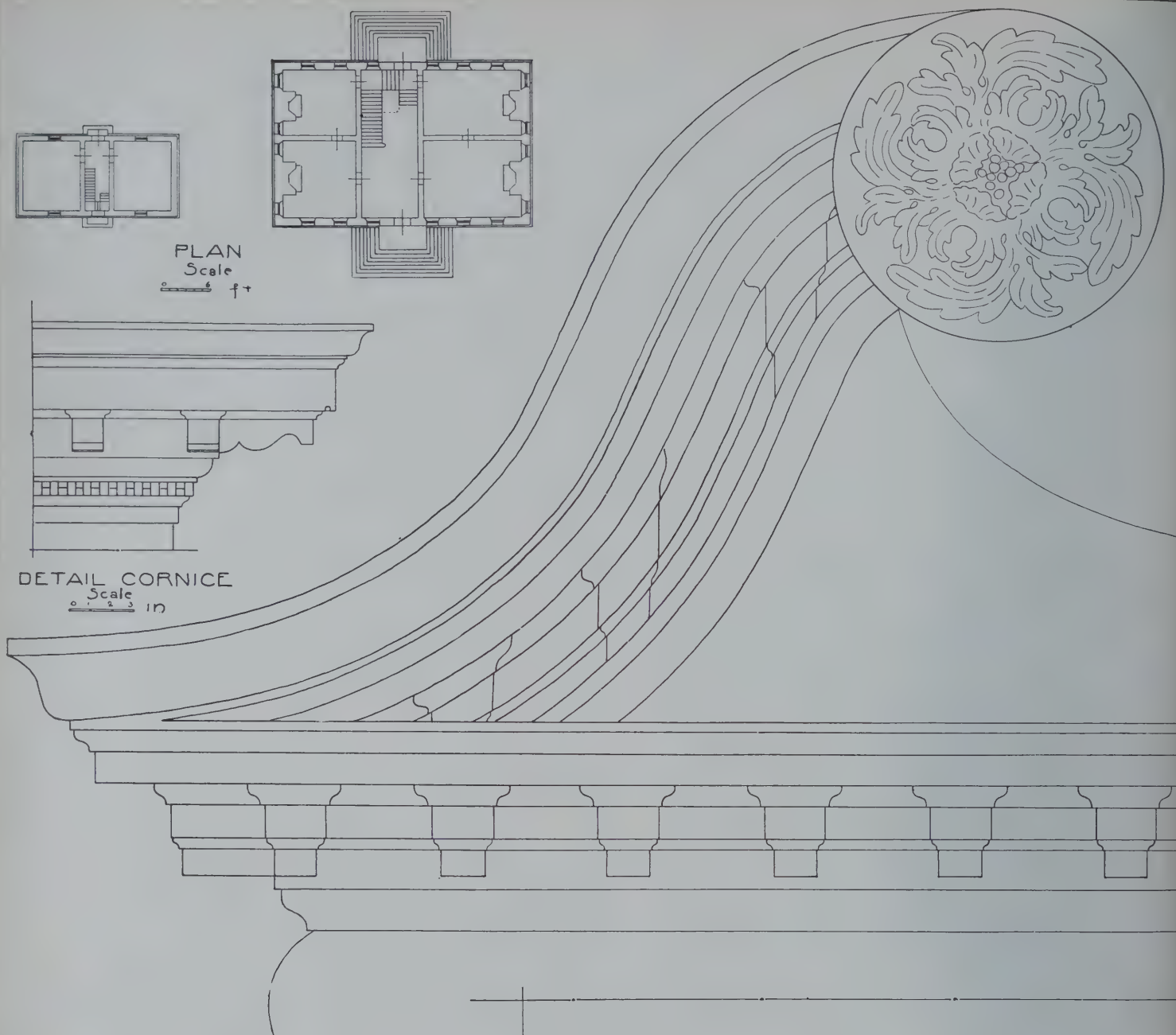
At Sabine Hall certain interior details are of particular interest, notably the doors, each flanked by two windows, which are placed at either end of the hall. These windows on either side of the doors, on the inside of the house, are framed by a quarter round instead of the usual architrave. This makes possible the building of the side partitions close to the windows and does not necessitate the hall being made the width of the architrave wider. The stairway at Sabine Hall leads to an upper hallway of even greater interest than that upon the main floor in that the ceiling is slightly lower and six windows are in place, three at each end. The stairway itself is placed in a stair hall to one side, but its fine workmanship is in entire accord with the other interior detail, especially the well designed balusters.

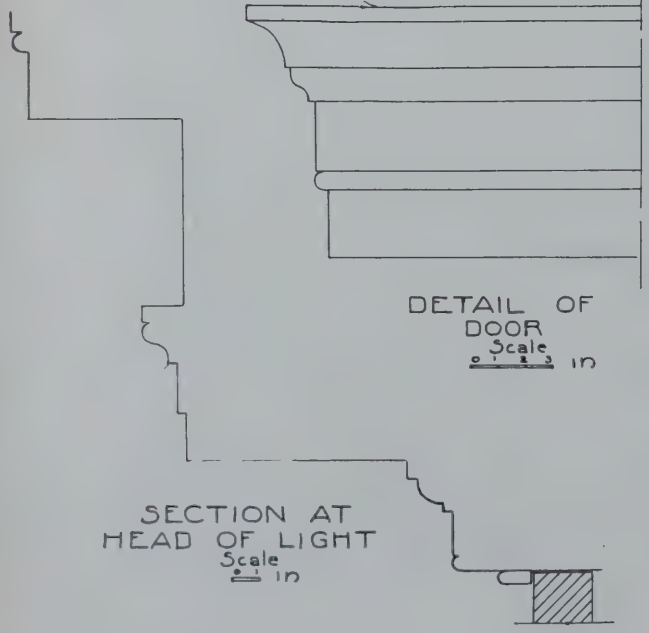


"Westover" from the Garden Walk

PLAN
Scale
0 6 ft

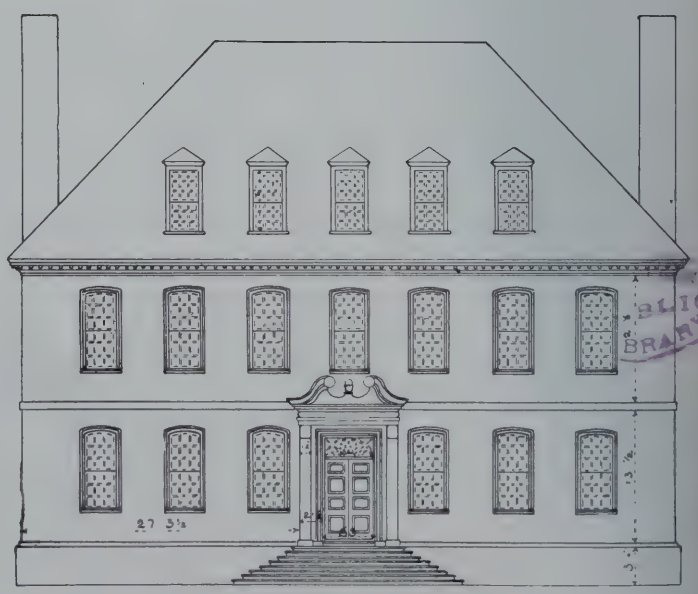
DETAIL CORNICE
Scale
0 1 2 3 in





DETAIL OF
DOOR
Scale
0 1 2 3 in

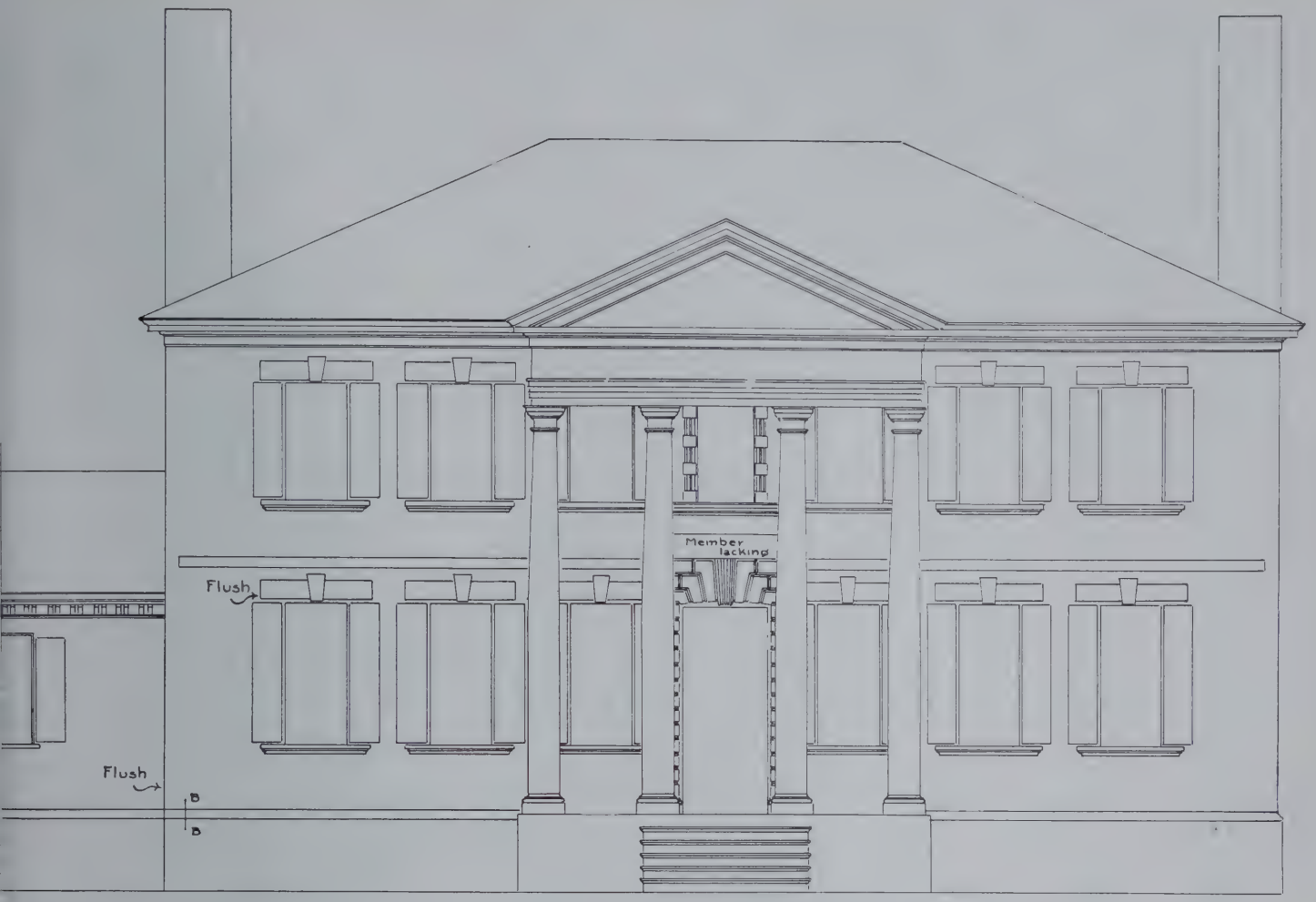
SECTION AT
HEAD OF LIGHT
Scale
0 1 in



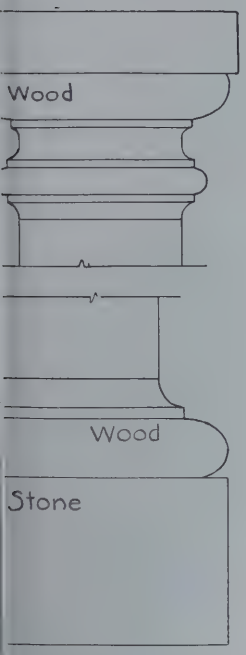
MAIN ELEVATION
Scale
0 1 2 ft

WESTOVER
JAMES RIVER
VIRGINIA

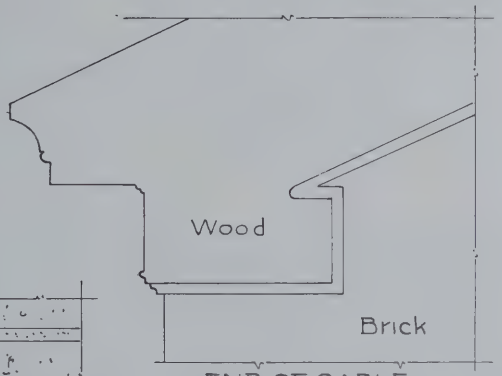
BLIC
BRARY



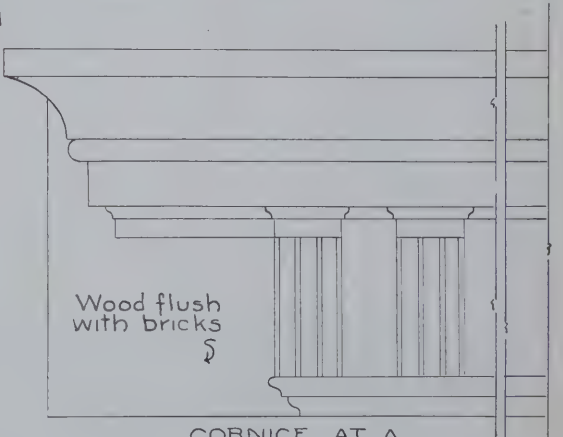
NORTH ELEVATION
Scale 0 1 2 3 4 ft



DETAIL OF COLUMN IN COLONNADE
Scale 0 1 2 3 in



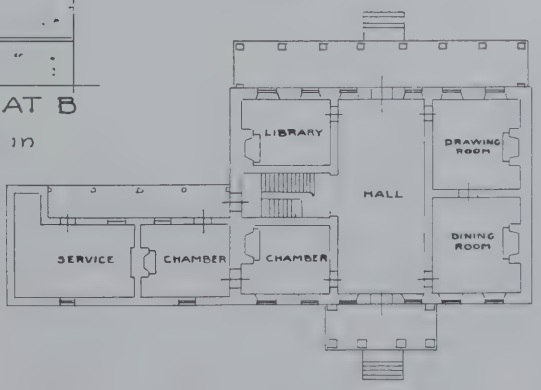
END OF GABLE IN WING
Scale 0 1 2 3 4 in



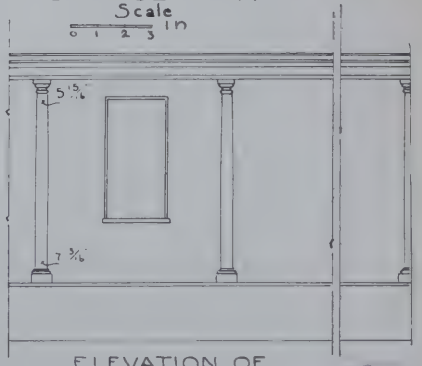
CORNICE AT A
Scale 0 1 2 3 in



SECTION AT B
Scale 0 1 2 3 in



GROUND FLOOR PLAN
Scale 0 6 ft

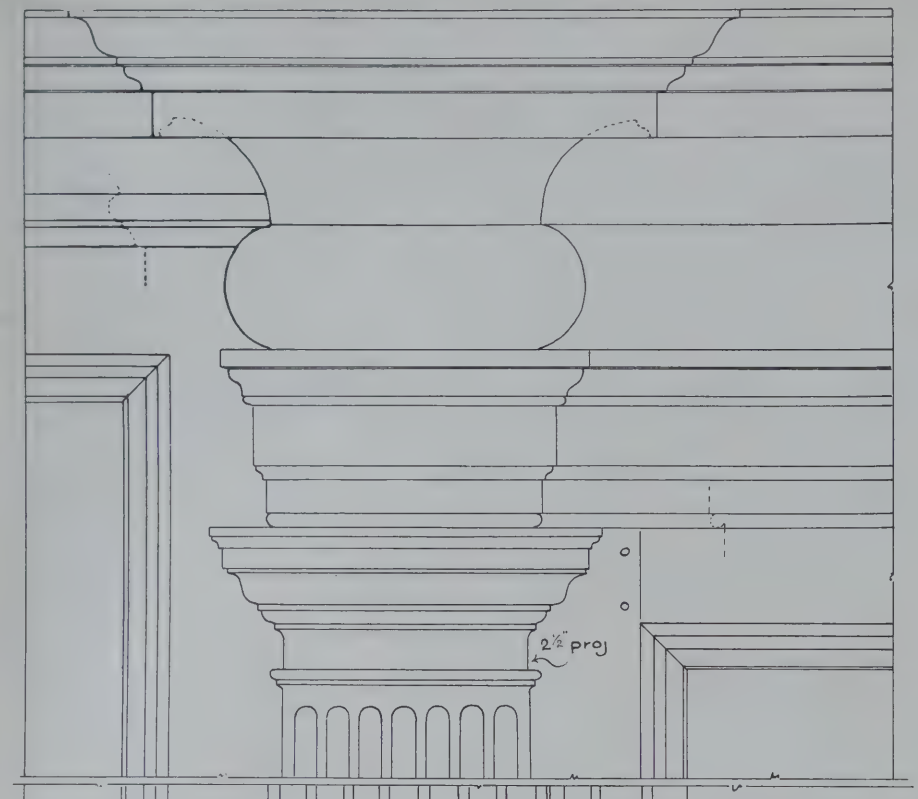


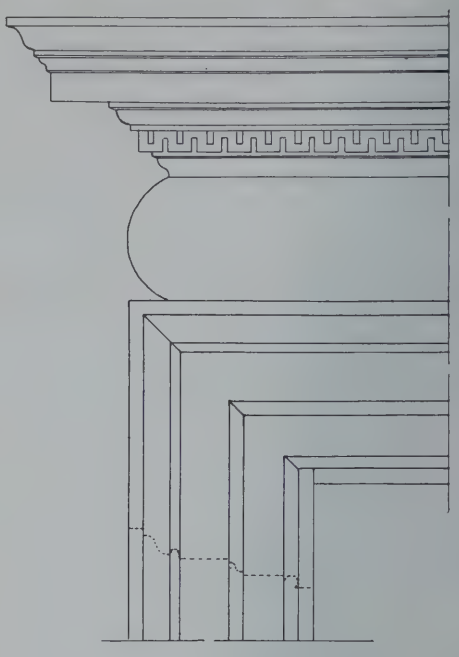
ELEVATION OF COLONNADE IN WING
Scale 0 1 2 3 4 ft

Note
Masonry is lime stone and brick Flemish bond
Bricks appear to vary 1/8 in size
Headers 4" x 2 3/4"
Stretchers 8 1/2" x 2 3/4"
Joints 1/2"
Headers are eye bricks

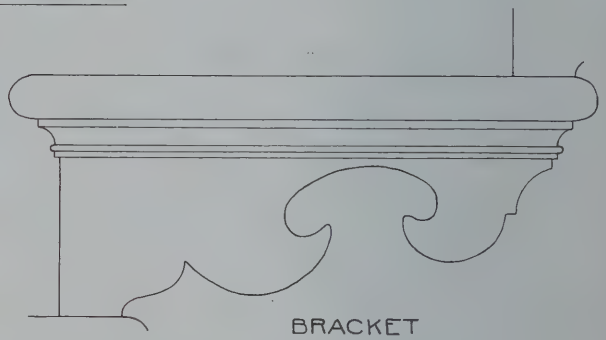
BOST PUB LIB

1730
SABINE HALL
RAPPAHANNOCK RIVER
RICHMOND CO
VIRGINIA





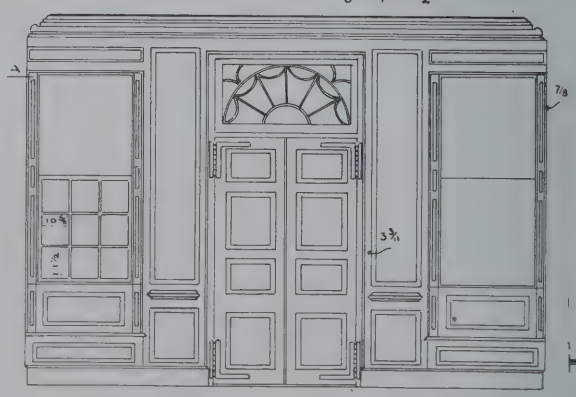
CORNICE OVER DOORS
Scale 1 in
0 1 2 3



BRACKET
Scale
0 1 2 in



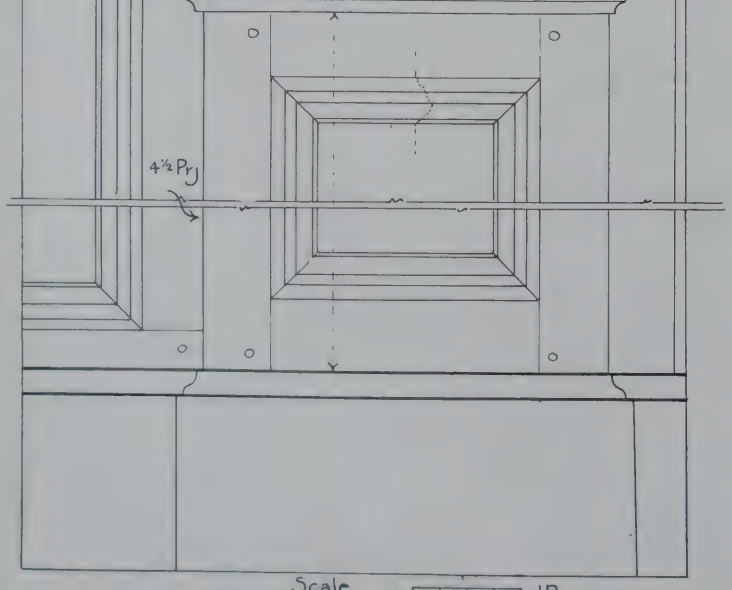
BALUSTER
Scale in
Note
Length of shaft 19¾" Other two are 17⅞ and 15¾



NORTH ELEVATION
Scale
0 1 2 3 ft



Section at A
Scale
0 1 2 in



Scale
0 1 2 3 4 in



Centre line

EAST ELEVATION
Scale
0 1 2 3 4 ft

DETAIL IN HALL SABINE HALL

DECORATION & FURNITURE

Jeanne Taylor, *Associate Editors*, Leland W. Lyon, R.A.

Decorative Fabrics Following Original Designs

THE field of possibilities of interior decoration is constantly being widened and enriched through the untiring efforts of manufacturers who have developed highly specialized departments of design. Here artists are creating new designs in furniture and fabrics, often adapting ideas and motifs from museum pieces and good originals in private collections.

Probably as never before, there exists a demand on the part of the American public for better artistic expression in the elements and materials which make up a home, even of the moderate cost type. The widespread nature of this demand has been noticeable in its influence on domestic architecture of medium cost, where before much that constituted good design and good taste was confined to the more expensive homes. Thus it is that the proportion of well designed dwellings of average cost has greatly increased in the past few years.



Japanese Brocade Available in Several Color Combinations

Photographs reproduced in this article by courtesy of Cheney Bros.

This condition has created at once a demand and a steadily developing market for well designed furniture and fabrics. It is for this reason that the making of fine furniture and accurately designed decorative materials has passed from the workshops and hand looms of the craftsmen to the great factories and intricate, power-driven looms which without sacrifice of artistic merit place within the reach of many, products for artistic home making which before constituted the possessions of only the few.

It is evident, therefore, that the efforts of a large number of designers working in the industries producing decorative materials must result in placing on the market designs in decorative materials and good furniture, some of which are adaptations and others direct copies from originals developed in the



Chinese Brocade with "Cycle of the Lotus," Flying Fish and Phoenix Motifs of Chien Lung Period
Medallion reproduced from rare embroidery in the Metropolitan Museum of Art



Printed Silk Fabric Depicting *Mi-careme* Festival Scenes in Paris

various artistic periods of older countries. Nowhere, perhaps, is this condition more evident than in the class of materials used for draperies and drapery linings, wall hangings and panels, furniture coverings and other upholstery uses.

It is a recognized fact that hangings, wall coverings and carefully selected upholstering serve in large measure toward the furnishing of a room, particularly in these days when simplicity is the rule rather than the exception, and rooms are not filled with large quantities of furniture. Just because the modern home is no longer crowded with a variety of objects, it becomes more than ever important that what furnishings there are shall be exactly what are required for the correct expression of the character of the interior.

It is evident, therefore, that architects who include in their work the planning of interiors are interested in following the development in the production of decorative fabrics, and from time to time in this Department suggestions will be given of available designs which seem particularly fitted for decorative schemes, and not only for large dwellings, but for moderate cost homes.

We present illustrations of a number of decorative fabrics in silk, and as it is impossible to show



East Indian Settings Furnish Design for Silk of Oriental Character



Motifs from Spain and the Mediterranean in a Drop Pattern Arrangement for Silk

them in color, brief descriptions of several are given which may suggest uses for them.

Two brocade designs, one Chinese and one Japanese, are shown on the first of these pages. Both carry conventionalized figures and are based on various oriental motifs such as the Cycle of the Lotus, the Flying Fish and the Imperial Phoenix, as shown in the Chinese design.

On other pages four types of fabric design are presented, the first representing Paris in the mid-lenten or *mi-careme* festival season. The Cathedral of Notre Dame is to be noted in the background. The figures in the floats are the king and queen of the carnival. Under the trees, which represent the gardens of Luxembourg, are two costumed figures of the period of Louis XV.

Another design is Spanish in character, showing various typical diversions of the Spaniards. Thus the dominant scene is the bull ring, showing the *matadore* with red cloak in hand and sword upraised. To the right of this appears the garden of Granada with a troubadour playing a Spanish guitar to his lady on the steps above. Farther to the right is a gipsy girl dancing and playing a tambourine. To the left of the bull ring one catches a glimpse of the Mediterranean with Gibraltar



Textile Print Inspired by Work of Japanese Artists Showing Familiar Features

in the distance, while above are two girls dancing the fandango. Another detail of the design suggests the garden of Granada by moonlight, and another little scene depicts a weary traveler on a burro approaching a wayside inn.

Two characteristic designs which express the warmth and richness of oriental life are to be found in the fabrics pictured on still another page. One of these portrays life in Buddhist India. The Taj Mahal is in the center of the design, and before it runs the River Ganges on which native boats drift leisurely. A typical Maharaja, under a jeweled canopy, is being entertained by a dancing girl. Here are to be found the five dancers of the royal festival dance of Siam, and across the river is to be noted a famous Jaganath Temple. Elephants in gorgeous trappings travel toward the great temple, and opposite an intricately carved stone temple gate the fakir is charming two cobras by means of his musical pipe.

Another interesting fabric of oriental design is conceived and executed in the manner of the Japanese wood block artists. The composition and the characteristic brush strokes of the masters of Japanese art have been followed carefully throughout the design, and empaneled signatures of six of Japan's great artists are incorporated as part of the decorative scheme. Fujiyama, as usual, is in evidence and the bamboo, cherry tree, bridge and Japanese ladies have been used to create an unusually interesting fabric design.

It is usual, when a reproduction is made of an old fabric of any period, or when an entirely new design is used, to produce the material in a line of quite a comprehensive variety of colors and color combinations, and this of course adds immensely to the possibilities which any given design may possess for the interior decorator, for these colors and combinations are chosen with reference to their suitability no less than to their practical use.



Mural Decoration by the Late Howard Cushing in Oval Room, House of Mrs. Willard D. Straight, New York
Woodwork of bright canary yellow and mantel of yellow Sienna and white marble. Delano & Aldrich, Architects



VIEW OF SODA FOUNTAIN

SODA AND CANDY SHOP, BROOKLINE, MASS.

JAMES CHARLES FLAHERTY, ARCHITECT



SODA FOUNTAIN AND ENTRANCE DOOR



TEA ROOM IN CONNECTION WITH STORE

THE BRUNSWICK SHOPPE, HOTEL BRUNSWICK, BOSTON, MASS.

BLACKALL, CLAPP & WHITTEMORE, ARCHITECTS



VIEW FROM STREET



FIRST FLOOR PLAN

SECOND FLOOR PLAN



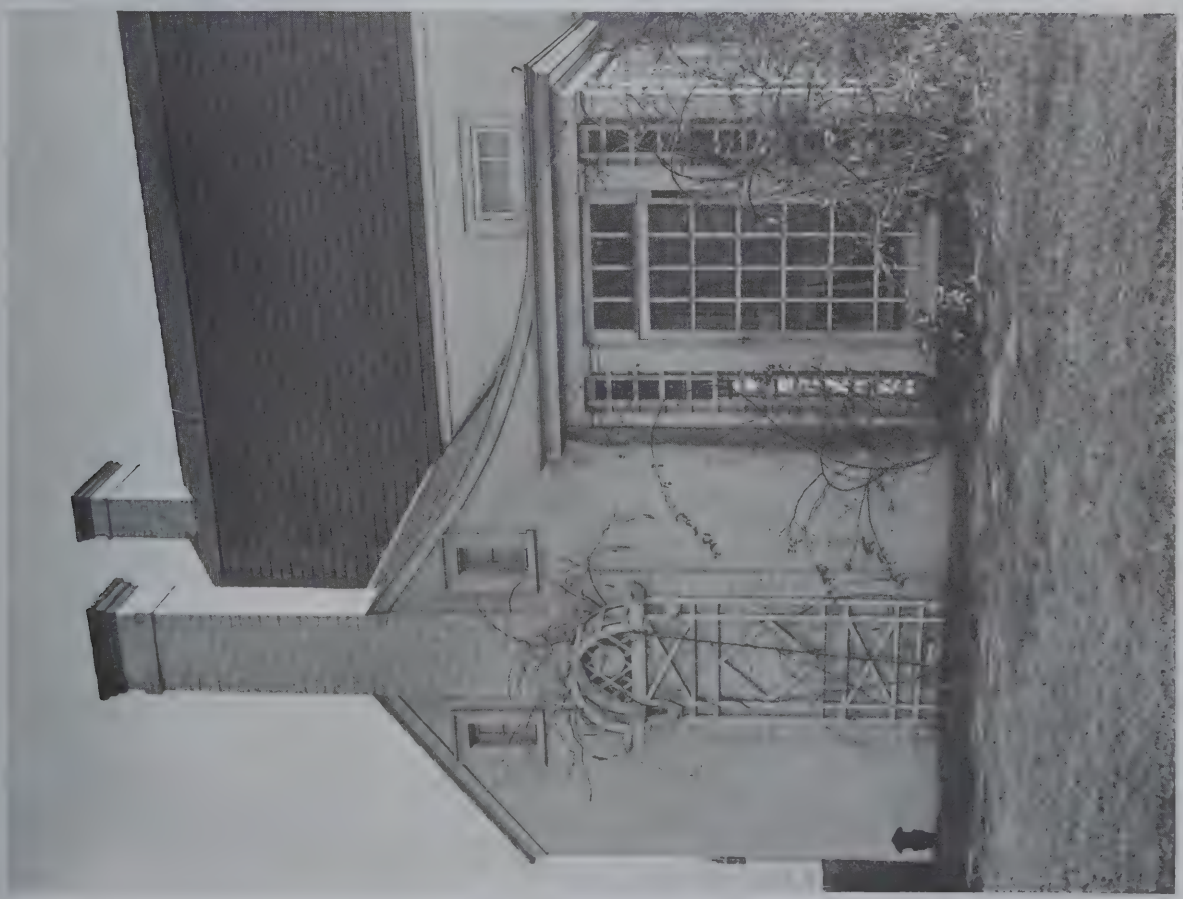
DETAIL OF ENTRANCE FRONT

HOUSE OF FRED B. SMITH, ESQ., BALDWIN, LONG ISLAND, N. Y.

FRED B. SMITH, ARCHITECT



KITCHEN WING AND ENTRANCE DOORWAY



HOUSE OF FRED B. SMITH, ESQ., BALDWIN, LONG ISLAND, N. Y.

FRED B. SMITH, ARCHITECT



LIBRARY IN HOUSE OF A. L. SEARLE, ESQ., MINNEAPOLIS, MINN.

TROWBRIDGE & ACKERMAN, ARCHITECTS

A two-story room finished in butternut with limestone fireplace. Simple plaster walls act as a foil for tapestry which supplies the color note. Window hangings are of crewel work



DINING ROOM IN HOUSE OF MRS. WILLARD D. STRAIGHT, NEW YORK, N. Y.

DELANO & ALDRICH, ARCHITECTS

The sturdy Georgian character of this room is reflected in its entire ensemble. Color is furnished by the silk velour chair coverings and Flemish floral panels in old gilt frames. The crestings on chair backs bear heraldic arms.

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Have We Reached the Turning Point?

IT is impossible to disguise the fact that at least during the past few months business has been very slow in the offices of most architects. Immediately after the close of the war almost every office was busy, but since the sharp decline in the volume of construction, the on y offices which have been busy are those which specialize in institutional buildings or which may be completing certain large projects begun some time ago.

In the average large office, and probably down to the smaller offices, there are employed today approximately one-third the number of draftsmen who a year or more ago were kept busy. The suddenness with which this change took place may be traced to the same general conditions which caused a rapid price deflation in many industrial and commercial lines.

Prices Breaking Downward

The public, having experienced a sharp break downward in commodity prices, has been eagerly watching the building material and labor markets, expecting a somewhat similar break which might tend to reduce construction costs. The fact that lumber prices have been so materially reduced has done much to encourage this viewpoint and, in a measure, has done a little to encourage construction.

There are, of course, diverging opinions regarding the possibility of a noticeable drop in the cost of other building materials during the next year. A study of relative costs, taken from recent figures in various sections of the country, shows that there has been an approximate decrease in construction costs of 20 per cent from the peak. Manufacturers of various classes of building materials, who have been interviewed in collecting data for this article, claim that any further sizable reduction in prices cannot be expected, at least until labor and transportation costs are decreased materially. There are several conditions which would seem to substantiate these statements.

In the first place it is apparent, by the very nature of the business, that there are not on hand extensive stocks of materials. The production of building material has always been maintained to meet the demand and there have been very few periods of over-production in this field. Consequently, it may readily be seen that this is no time to expect sharp price declines on account of over-production.

Unquestionably, the public is still looking for this decrease in prices. During the month of March a questionnaire was circulated through the pages of *The Builders' Journal* in an endeavor to obtain first hand information from builders and material dealers in various sections of the country. The questions which were asked may thus be briefly outlined:

1. Do you anticipate activity in home and moderate cost building in your locality in 1921?
2. Is it difficult to obtain building loan and mortgage money locally?
3. Is there a dwelling shortage in your locality?
4. If building is "slow,"—why?

Replies to this questionnaire were received from every section of the country, and these answers probably represent the consensus of opinion:

1. Some building activity expected, but definite activity seems certain by the fall of 1921.
2. Less difficult to obtain mortgage money now than it has been.
3. There is a very definite dwelling shortage in most localities.
4. Local building is "slow" because the public is still waiting for a further decrease in material and labor costs. There is every reason for labor to accede to wage reductions. There is a decided increase in the efficiency of building labor and a noticeable return to the building industries of workmen who have been engaged during previous years in other work.

For further substantiation of this condition we may turn to the interesting nation-wide survey just made by The Fidelity and Deposit Company of Maryland. This is the second survey of this nature which has been made by this large financial institution, and from it we have selected certain points which are of direct interest in connection with the building activity:

1. There have been appreciable wage reductions in the building industry in these sections of the country:

New York district,
Pennsylvania district,
Ohio district,
Indiana, Michigan, Wisconsin and West-North Central district,
South Atlantic district,
East-South Central district,
West-South Central district,
Western Mountain district,
Pacific district.

It may be noted that these reductions have been

largely forced through by building trades employers.

2. The productivity of labor per man in all industry has increased since last September in every section of the country.
3. (*a*) There is need for building construction in the low priced dwelling class in every section of the country.
   (*b*) A demand exists for high grade dwelling and apartment buildings in all but the South Central and Western Mountain districts.
   (*c*) Factories and warehouses are needed in New England.
   (*d*) For office and store buildings there is strong demand on the Pacific Coast.
4. Sentiment is not favorable toward building operations, at present costs, in any section of the country.
5. Savings accounts have increased throughout the Northeastern and North Central states and in California. In other sections of the country, particularly throughout the South, the total of savings has decreased.
6. This survey shows no noticeable movement of men back to the farms from industries, which would indicate the existence of a continued pressure of the housing shortage.
7. The chief local questions in practically every community seem to be taxation and housing shortage. The principal national questions, as reported from each section, are taxation, tariff and peace settlement.

This survey has been analyzed by the Hon. David F. Houston, from whom we quote: "The country has successfully borne the strain caused by a most notable drop in prices, particularly of a vast volume of raw materials, and has weathered a trying period of liquidation. The demand for finished products has not developed to the point where our factories feel justified in taking the requisite quantity of our surplus raw materials to furnish the necessary relief to their producers; but there are some indications of a change in this direction. Business men realize that forced action, based on artificial optimism, may lead to unfortunate results and produce further embarrassment. The foreign situation has not shown the expected improvement, and continued difficulties are experienced in discovering effective European markets for our commodities.

"Certain favorable conditions are indicated in this survey. The cost of living has appreciably diminished. *Building operations in a number of districts tend to increase in number.* There have recently been no strikes of consequence and greater productivity of labor per man is reported from all districts. Raw materials are plentiful, and physical transportation conditions are good. There have been no business failures of any importance. The crop outlook is satisfactory and the banking situation has improved. It is believed that confidence in business circles is slowly spreading, and that while there is hesitancy the business men of the country are feeling their way with sound business caution, and the country is working back toward a more stable condition."

The present high cost of freight transportation seriously affects building costs, in that it is applied from the time the material in raw form is shipped to the factory, until it reaches its final destination at the building. When we add to this the disturbed condition of the labor market in the building field, we have a situation which, though it may be plain to those who take a professional or service interest in construction, is not readily understood by the building public.

We understand from unofficial sources that this question of railroad rates—both for passenger service and freight transportation—is to be taken up seriously when congress convenes again, and that a reduction in rates throughout may certainly be expected. This condition cannot but reflect beneficially upon the building industry, and if it proves to be sufficiently drastic must favorably affect building material costs. We may note here, however, that a reduction of prices by manufacturers will not be immediately felt, as it will be necessary for dealers to get rid of any stocks which may be on hand before this price reduction enters definitely into the retail field. The survey referred to shows that sharp reductions in wholesale prices of commodities have not yet been entirely reflected through similar reductions in retail prices.

The Question of Building Labor

It is apparent that labor in the building field is in a state of unrest, which might well be expected when the temporarily suspended law of supply and demand begins to function, feebly at first but with increased strength, as labor decentralizes from other industries which have drawn it away from the building field.

A brief analysis of this condition shows that many good mechanics of the building trades are coming back from the automobile plants and the war industries, seeking again the work for which they were originally trained. Viewing broadly the proposition of labor in the building industry, it is questionable whether any law except the economic law of supply and demand will ever govern labor costs for an extended period. The power of labor unions is naturally greatest at the peak of demand, and weakest in the valleys of building inactivity.

We hold here no brief against union labor, but owing to the unfair application of the principles of unionism, as affecting the building industry during the past five years, we are thoroughly committed in our own minds to the open shop policy or to a re-establishment of the functioning and requirements of labor unions in this industry which will recognize the difference in the productive value of individuals—in other words, taking off the limitation of production so that every laborer shall be worthy of his hire, and in turn shall receive proper value for his services.

In the foregoing paragraphs we have endeavored to make clear some of the fundamental economic conditions which bear upon the building situation today. It would seem that a number of these perplexing problems are reaching a point where it will be possible to offer logical and practical solutions. It is certain that conditions are not getting worse, nor are we yet in a definitely quiet period. Having recently visited the offices of many architects in the East and Middle West, we find indications of increased business where, during the past few months, there has been no interest on the part of clients, but where now architects are reporting inquiries and, in some cases, definite increase in the volume of work.

So it would seem that the first phase of returning building activity is now opening up—that is, the period when prospective builders realize that there is not much to gain by waiting, and those who are in immediate need of buildings of various types are now proceeding seriously to the business of planning and construction. There is naturally a great interest in new houses, but a still more definite interest is to be noted in the provision of schools, hospitals, and other institutional buildings, a condition to be expected at this time.

Out of the maze of conflicting opinions there may be gained these definite impressions:

1. That the year 1921 will show approximately an average volume of building construction.
2. That money spent in this field will be principally for buildings of the habitation class.
3. That there will be further progress toward settlement of the labor question, and some additional reduction of material prices which will make the year 1922 an opening year of sound activity in building construction.
4. That this period of activity, when it does open up, will continue steadily for at least five years.

It must be realized, of course, that this is only an expression of opinion, but as it is a reflection of the best professional and public opinion it seems to be about the most valuable forecast available at this time.

It is certain that there will be during the next year more recognition on the part of the federal government of the problems and needs of the building industry, which has definitely suffered under the past administration. The country has apparently passed the worst of its period of business depression, and part of the program of reconstruction being necessarily a program of building to meet building shortages, all evidence is favorable to the interests of those engaged in any branch of the building construction industry.



A Country House Near Apeldoorn, Holland
A. H. Wegerif, Architect

Results from Tax-Exemption

A RECENT New York ordinance exempting from taxation, entirely or in part, all residential construction done during a period of two years, has already shown definite results in stimulating building activity. This is probably the most practical measure toward this end that has as yet been put into effect in the United States. It is evident, therefore, that this question of tax-exemption should be given serious consideration in every city and community where shortage exists.

Briefly, this ordinance, which is retroactive and covers a period from April, 1920 to April, 1922, exempts from real estate taxation for a period of ten years $5,000 of the appraised valuation on any individual dwelling, and $1,000 a room up to five rooms on each apartment of multi-family dwellings. In other words, on a dwelling with land that is appraised for taxation at $8,000, taxes are to be paid only on the balance of $3,000. The present New York tax rate being $2.85, it may be seen that this ordinance saves, per family housed, approximately $142.50 a year, or $1,425 in ten years. This is an actual saving which is negotiable from a real estate viewpoint. On a two-family house the saving would be twice as much, and similarly in buildings containing more apartments the saving would increase, in accordance with the terms of the ordinance.

While this ordinance has been in effect only a few weeks there are already in evidence a number of interesting results. It may be noted first that activity in the sale of improved realty has increased, a number of recently constructed apartment houses having already been sold under the new cost-saving conditions created by this ordinance. Brokers in outlying districts of the city, where land values are low, report a greatly increased interest in purchase of vacant property for building purposes. Naturally the effect of this exemption will be most beneficial to the inexpensive type of houses where relative proportion of exemption to total appraised value is high. Thus on a dwelling in the high land value districts, where the lot might be appraised for $15,000 and the building for an equal amount, the exemption would represent only $5,000 on a $30,000 appraised value, or a tax-exemption of approximately 17%. In the outlying residential districts, where a $15,000 house might be built on a lot worth $3,000, the tax-exemption would be approximately 30%. Similarly, in the low cost district a house costing $7,000 might be erected on land worth $1,500 and the appraised valuation here, based on present appraisal methods, would probably be about $5,000, which would make this house exempt from taxes for a period of ten years.

The result of this condition is already reflected in architects' offices, particularly in Brooklyn and other districts where land values are not high. Several speculative housing operations which have been in abeyance are now proceeding.

Walter Stabler, Comptroller of the Metropolitan Life Insurance Company, at a recent meeting of the Board of Estimate of New York reported that since the passage of the tax-exemption ordinance this company had loaned over $2,000,000 to builders of five-story apartments of the walk-up type, and that he considers the ordinance responsible for a great deal of building activity.

It is interesting to note that the definite effect of this ordinance is being felt exactly where the housing shortage is greatest, that is, in the districts available for the construction of moderate cost dwellings and apartment houses. Evidently in the outlying sections of other cities of the United States, and in small cities and towns where the housing shortage is acute, a tax-exemption measure would go far toward encouraging home building.

Many of the savings banks and other loaning institutions which have been approached for mortgage money have been willing to loan, but restrict their appraisals to the pre-war building valuations. This is because they have been afraid of shrinkage in the replacement costs of buildings. This tax-exemption measure, which has the effect of actually reducing the cost of construction by amortizing $1,400 per family back to the purchaser over a period of ten years, naturally reduces this much of the potential shrinkage in value, and should influence the mortgage market toward a more liberal appraisal and toward the encouragement of building by increasing the local volume of money available for building and for permanent loans on structures for dwellings.

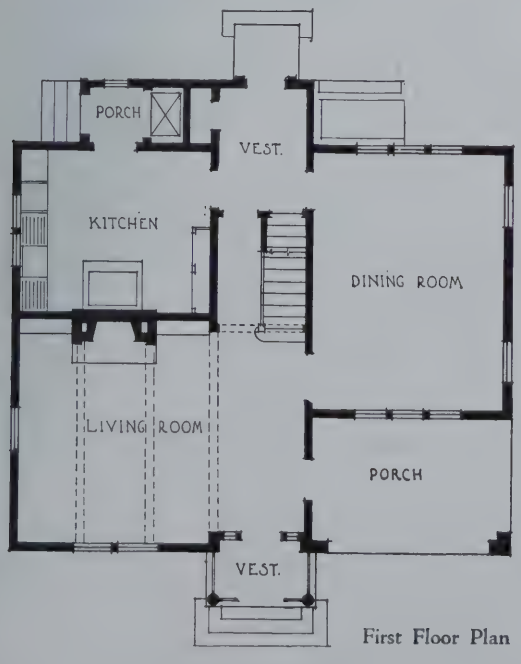
Builders, architects, real estate operators and others interested in stimulating local activity should, therefore, give serious consideration to this important action in New York, and realizing its results should make a definite effort to bring about some form of tax-exemption elsewhere. It is true that strong opposition has been brought to bear on this measure and that several arguments have been advanced, some being in the interests of property owners who are not in the exemption class—in other words, those who own buildings constructed before the tax-exemption period.

From the viewpoint of the municipality there is nothing to lose and much to gain by limited tax-exemption of this type. Practically all dwellings constructed because of an inducement of this nature will pay taxes on the amount of appraisal in excess of the exemption, and there will also be an increment in the value of land in districts in which these houses are constructed which will reflect favorably on the income of the city because of an increase in taxable values. But more important than this is the fact that through this means the housing shortage may be somewhat relieved and considerable sound activity developed in the building material and building labor markets.

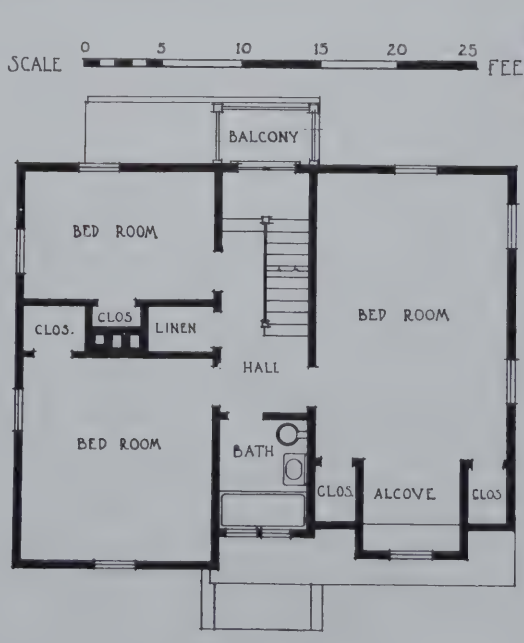
A Small House at Yonkers, N. Y.

ARNO KOLBE, ARCHITECT AND OWNER





First Floor Plan



Second Floor Plan

POST PUBLIC LIBRARY

EDITORIAL COMMENT

CALDER COMMITTEE REPORT

THE results of the hearings and investigations, conducted over a period of many months in different sections of the country, by the United States Senate Committee on Reconstruction and Production is now made available to the public. The Committee, owing to its government appointment, had the opportunity of digging deeply into the many conditions that have operated to retard construction, particularly the building of homes, on which the Committee's work was chiefly centered.

Houses will not be built in any appreciable numbers until the public has become satisfied that material prices and wage rates have reached a reasonable basis and that investment will not be jeopardized by falling realty values. This is the chief obstacle to construction, and it will not be removed by investigations, conferences or government fiat. Aside from this there are, of course, a number of influences at work that have served to make construction difficult, even granted that its cost was not the deterrent factor.

Chief among the conditions which have been found to work to the disadvantage of building is the question of credit. On this the report says: "The history of the past two years shows that enterprises producing luxuries and consumable goods have promised greater profit than have enterprises providing housing, transportation or the development of national resources.

"Loans have been available to make possible the hoarding and maintenance of high prices of sugar, cotton, wool, hides, foodstuffs, etc., and this has resulted in maintaining the cost of living at an artificial level in defiance of the law of supply and demand. . . . The paradox has been that money has not been loaned for building because the cost of building has been too high but money which has been loaned for trading in commodities has so increased the cost of living that the cost of building has increased."

The other recommendations deal chiefly with matters of taxation and would react only slightly on new construction, with the exception of the provision for the exemption from taxation on interest of mortgage loans not exceeding $40,000 when such loans are held by individuals.

The sum total of the Committee's efforts, if enacted into legislation will, it is seen, help but little in supplying the houses that are so badly needed. They will tend, of course, to reduce the cost of financing and other promotion expenses, but these items are but a small part of the cost of construction and the major items—materials, transportation, wages and efficiency of labor—must remain to be worked out in accordance with the law of supply and demand.

This is rapidly taking place and is already showing its effect in growing construction activity. To quote from the report,—"When the commodity index figure of wholesale prices of building materials approximates that of general commodities, there can be little reason to fear loss in investment in building through future lower replacement values, and because of the accumulated demand for structures of all sorts, building materials will be safe if they reach such a level in the near future."

Following the release of restrictions by the government on material costs, the wholesale index figure reached the point of 256 in November, 1919 as compared with 100, the base in 1914. This rise was, however, more gradual than that of general commodities because they had already reached the point of 207 in November, 1918. May, 1920 saw both reach their maximum level, building materials being 341 and general commodities 272. At the end of January, 1921 building materials stood at 239 and general commodities at 177.

The divergence between the figures is, therefore, constantly growing less and with the rapid fall of the last several months, which has probably not been recorded in any other similar period of economic history, building materials may very soon be expected to reach a level which will provide a stabilized basis for the resumption of construction of all kinds.

THE MISPLACED KEYSTONE*

By Ernest O. Bostrom, Architect

Inspired by the cartoonist's conception of where the A. I. A. belongs in the building industry as illustrated in The Architectural Forum of February, 1921.

ONE fell glance—
Just by chance,
Made me want to hop and prance.

Made me mad—
Same time sad,
To think that it could be so bad.

Didn't you see—
What the key
Of the arch was now to be?

Can't you wake?—
Must I shake?
Must the very arch stones quake?

We must think—
Not just blink,
And not only splatter ink.

We must act—
That's a fact!
With all wisdom, speed and tact.

Public thought—
Can't be bought,
Should be moulded as it ought.

Off we must—
Shake the dust,
Ere the very brain cells rust.

Am I right?—
Then let's fight,
That which we believe a slight.

Who will stay?
Join the fray!
It will be a battle gay.

Be not slow—
We will show
Where the key should *really* go.

And its name—
Borne by Fame,
Shall be classed with Art again.

*This poem, as printed, is much abbreviated from the original.



Observe the driving core inside the spirally reinforced steel shell—It is used only to drive the completed shell, which serves as a form for the concrete.



Raymond Concrete Pile Co.
New York, 140 Cedar Street
Chicago, 111 W. Monroe Street
Raymond Concrete Pile Co., Ltd., Montreal, Can.
Branch Offices in All Principal Cities

"A form for every pile
A pile for every purpose"

Manufacturers' Catalogs and Business Announcements

PRIZE DESIGNS ON CERAMIC BUILDING

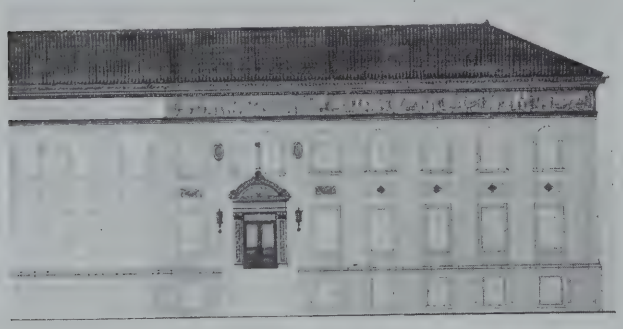
THE New Jersey legislature has voted to Rutgers College, New Brunswick, N. J., an appropriation of $100,000 for the erection of a building for the future School of Ceramics. The manufacturers of ceramics, particularly the makers of terra cotta, are interested in having the facade of the building show the development and merit of their product. For this purpose they offered two



First Prize Design
Submitted by E. W. Moell

prizes for the best designs submitted of a brick facade with terra cotta trimmings, the plans for the building having been prepared by the State Architect, F. H. Bent.

A committee consisting of the State Architect, G. H. Brown, Abel Hansen, J. W. Mettler, E. V. Eskesen and the late Oswald Speir, received four-



Second Prize Design
Submitted by S. R. Audsley

teen designs, all of which gave every indication of conscientious work and painstaking study. The first prize of $200 was awarded to E. W. Moell, Rocky Hill, N. J., and the second, of $100, to S. R. Audsley, Perth Amboy, N. J.

Advice on Acoustics

GEORGE C. HANNAM

Acoustical Engineer

1400 Broadway - - New York, N. Y.

ANNOUNCEMENTS

Mr. Harold Macklin, architect, announces the removal of his business to Winston-Salem, N. C., with offices at 311-313 Wachovia Bank Bldg. Manufacturers' samples and catalogs requested.

Messrs. William Crutchfield II, Wilson A. Gosnell and Gordon L. Smith have formed a partnership for the practice of architeeture under the name of Crutchfield-Gosnell-Smith, Associate Architects, with offices at 1239-41 Volunteer Bldg., Chattanooga, Tenn.

J. G. Legel & Co. have opened an office for the practice of architecture at 511 Wilson Bldg., Clinton, Iowa. Manufacturers' catalogs and samples desired.

BOOK NOTE

LANDSCAPE ARCHITECTURE: A classification scheme for books, plans and other collected material, by Vincent Hubbard, Assistant Professor of Landscape Architecture at Harvard University and Theodora Kimball, Librarian at the School of Landscape Architecture at Harvard University. 132 pp., bound in paper.

ONCE a collection of material on any given subject is begun there arises immediately the need for some definite scheme for its filing and classification. This book provides a satisfactory guide for its particular subject. It is the first published comprehensive classification of the field of landscape architecture, and is based on a system which has been developed in the Library of the School of Landscape Architecture at Harvard University. It provides for the arrangement of all manner of data, whether from published sources or from photographs and plans or from miscellaneous notes and references. It parallels, in its general scheme, the city planning classification previously published by the Harvard University Press.

Aside from its direct application in landscape architecture it should be full of suggestion to architects in formulating a scheme for classifying and filing individual collections of material relating to architecture.

ANNOUNCEMENT OF SUMMER COURSES

THE Department of Architecture at the Massachusetts Institute of Technology is glad to state that the following courses will be given this summer at the Rogers Building in Boston; namely, Shades and Shadows, Perspective, Office Practice, Elementary and Intermediate Design, Elementary and Advanced Constructive Design, and Structural Design. Any of these courses if satisfactorily passed may be substituted for corresponding winter work.

Detailed information concerning these courses can be procured by application to Professor William Emerson, 491 Boylston St., Boston, Mass.

THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 5

CONTENTS for MAY 1921

PLATE ILLUSTRATIONS

	Architect	Plate
HOUSE OF GORDON STEWART, ESQ., WHITESTONE LANDING, N. Y.	*Frank J. Forster*	64, 65
HOUSE OF R. G. PACK, ESQ., CLEVELAND, OHIO	*Howell & Thomas*	66
HOUSE OF FRED NICHOLS, ESQ., CLEVELAND, OHIO	*Howell & Thomas*	67, 68
HOUSE OF THOMAS WHITE, ESQ., CLEVELAND, OHIO	*Howell & Thomas*	69
HOUSE OF MRS. W. C. SCOFIELD, CLEVELAND, OHIO	*Howell & Thomas*	70
HOUSE OF ROLAND W. WHITE, ESQ., CLEVELAND, OHIO	*Howell & Thomas*	71
HOUSE OF C. A. FORSTER, ESQ., CLEVELAND, OHIO	*Howell & Thomas*	72
HOUSE OF DR. LYNN FULKERSON, FIELDSTON, NEW YORK, N. Y.	*Dwight James Baum*	73, 74, 77, 78
BREAKFAST ROOM, HOUSE ON LONG ISLAND, N. Y.	*Trowbridge & Ackerman*	75
DINING ROOM, HOUSE AT OYSTER BAY, LONG ISLAND, N. Y.	*Delano & Aldrich*	76

LETTERPRESS

	Author	Page
DOORWAY OF SAGRARIO, CATHEDRAL, MEXICO CITY. Drawn by O. R. Eggers	*Cover Design*	
THE EDITOR'S FORUM		39
THE CASINO, VILLA BERCHET, ITALY	*Frontispiece*	
THE AMERICAN INSTITUTE OF ARCHITECTS' CONVENTION		153
AIRPLANE VIEWS OF "MOUNT VERNON," NEAR WASHINGTON, D. C.		155
VILLAS OF THE VENETO III. The Villa Berchet, near Mestre, Italy	*Harold Donaldson Eberlein and Robert B. C. M. Carrere*	157
"EUCLID GOLF," CLEVELAND, OHIO	*Howard Dwight Smith*	165
Howell & Thomas, Architects		
DECORATION AND FURNITURE DEPARTMENT		173
Mural Painting for Minor Buildings		
Decorative Features in a Remodeled City House		
THE CENTRAL MANUFACTURING DISTRICT, CHICAGO, ILL.		177
Part II. S. Scott Joy, Architect		
DEPARTMENT OF ENGINEERING		183
Steel Construction, Part II, *Charles L. Shedd, C.E.*		
Terra Cotta Roofing Tile, Part III, *Alfred Lo Cascio*		
EDITORIAL COMMENT		190

ALBERT J. MacDONALD, Editor

Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.
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The editorial and general offices of
ROGERS AND MANSON COMPANY, Publishers
are now located at 142 Berkeley Street, Boston 17, Mass.



Architect and Owner—Russell F. Barker, 1120 Farmington Ave., West Hartford, Conn.
Contractor—The Bent-Bartlett Co., 43 Ann St., Hartford, Conn. Bishopric Medium Weight Creosote Stucco Base used on Exterior

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Res.—Mrs. Wm. B. Green, 133 Steele Road, W. Hartford, Conn.
Architect—Russell F. Barker, 43 Ann St., Hartford, Conn.
Gen'l Cont.—W. A. Wilcox, 327 Trumbull St., Hartford, Conn.
Stucco Contractor—Peter Leone
Bishopric Stucco Base used on Exterior

Mr. Russell F. Barker, Architect, Hartford, Conn., says:

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THE EDITOR'S FORUM

A STEP NECESSARY TO HASTEN BUILDING CONSTRUCTION

A GROUP of producers, representing all of the larger building materials manufacturers' associations, has recently carried to President Harding its demand for prompt action against high freight rates which are now impeding building construction generally. The President is said to have approved this important step, and it is believed that in this way the freight rate problem may be brought to an immediate solution, thus greatly assisting in hastening construction work throughout the country, through concessions which may be made by freight carriers and by the materials producers in order to stimulate immediate buying.

The producers of building materials contend, properly, that freight rates are holding up building, in spite of the fact that there is a known demand for at least 1,000,000 dwellings and for many types of larger structures, together with an extensive road building program.

In recent conferences held in Washington with Chairman Winslow of the House Interstate Commerce Committee, and with Chairman Clark of the Interstate Commerce Commission, this joint conference was suggested. We understand that at that time Mr. Clark asked if the producers were willing to cut prices for 90 days to get building going. The reply was that such a step could be seriously considered, provided the railroads would cut rates on the hauling of such materials.

The material manufacturers in presenting the case to President Harding have demonstrated that the chief cause of delay in building work is in the charging of excessive freight rates, particularly those applying on materials which are heavy and of low value. Freight rates on building and road materials have been increased on an average of 110 per cent since 1917, as compared with 75 per cent on other forms of merchandise which are general commodities. Some instances have been shown where the rates on building and road making materials are now in excess of their prices at the points of production. It is evident that rates have been advanced far beyond the figures which this traffic can possibly bear.

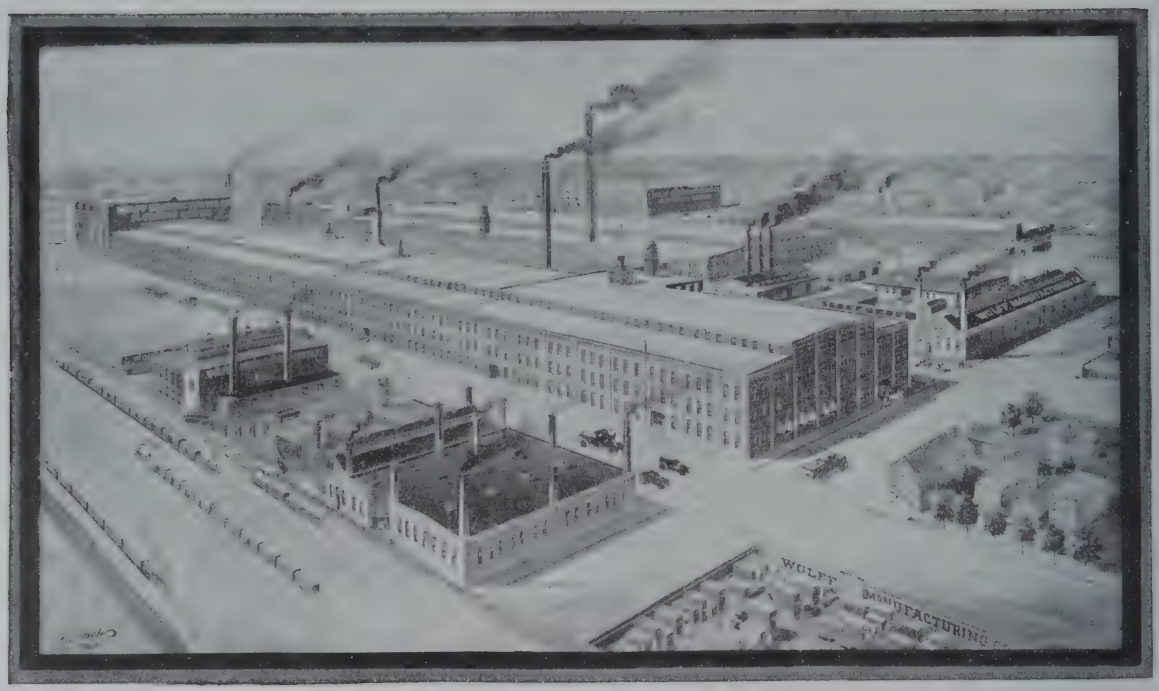
The determined stand which manufacturing associations are taking in this matter, together with their apparent willingness to consider a sacrifice of immediate profits for the period necessary to get building under way, is to be highly commended. The idea of sacrificing something in the way of profit for the time being, in order to cut the cost of building, is one which should appeal in a practical manner to all branches of the building industry.

The time of retrenchment is here. It is a period when everyone is called upon to sacrifice in some measure for the benefit of the public and the industry, or a dull period will set in which must result in inactivity and dull conditions which will frustrate every effort to stimulate the necessary activity in the building field. It is not a question of who will give in first, or whether any branch of the building industry shall or shall not give in. Ultimately, the pressure of economic conditions will force such action. Is it not better, therefore, that all interested parties should meet the situation half way and benefit by cumulative momentum, which would thus be provided, than to be forced to endure a similar situation over a long period?

There is just one basic method of stimulating building today, and that is for every interested individual and organization to shake off the inertia of this dull period, which is only a lull before a storm of building activity. Hard work and low profits should be the slogan throughout the building field. It is better to be active, with little or even no profit, than to keep on deluding ourselves with the idea that the so-called buyers' strike will end, and that the force of demand will hasten a volume of construction, regardless of the attitude of those whose services are called upon to meet this demand. Today there is not such a prohibitive difference between the actual costs of building and the figures at which the public is willing to build that it cannot be largely eliminated by cutting profits for the time being, and by really going to work. Notwithstanding loud paper protest, organized labor in the building field is realizing this fact. In spite of paper statements, we know that some architects are realizing this condition also, and are doing their part to encourage immediate building. If each branch of the building industry will do its part, we may expect the beginning of sound activity in the early fall of 1921.

DEPARTMENT OF COMMERCE TO STUDY BUILDING INDUSTRY

SECRETARY of Commerce Hoover announced in his address at the A. I. A. convention in Washington the appointment of seven architects and engineers, to advise with him on the national housing problem and related subjects pertaining to building. The members of the Committee are Ira H. Woolson, consulting engineer of the National Board of Fire Underwriters; Rudolph P. Miller, Superintendent of Buildings of Manhattan; J. R. Worcester, consulting engineer, Boston; Prof. W. K. Hatt, of Purdue University; J. A. Newlin, of the Forest Products Laboratory; Ernest J. Russell, architect, St. Louis, and Edwin H. Brown, architect, Minneapolis. The study of building codes, with the purpose of suggesting minimum standards, will be one important detail of their work.



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THE CASINO, VILLA BERCHET
ON THE TERRAGLIO, NEAR MESTRE, ITALY

"Villas of the Veneto"

The
ARCHITECTURAL
FORUM

VOLUME XXXIV MAY 1921 NUMBER 5

The American Institute of Architects' Convention

WASHINGTON, D. C., MAY 11, 12 and 13

THE commercial and business structure of our country is in the midst of great economic difficulties. It is but natural that these difficulties should be reflected in the practice of architecture, which is dependent in an almost complete measure upon business prosperity. Dissatisfaction with present conditions is to be expected, and much straining and pulling are evident in an attempt to give artificial impetus to the process of settlement, which can only work out gradually in accordance with economic laws. The result is a confusion of ideas, a tendency to follow bypaths that offer tempting prospects; a questioning of the soundness of principles previously accepted as fundamental; all ending in obscuring the main goal—which must be kept in clearer sight today than ever before.

Such is the condition in a great majority of human activities; such is the condition within the architectural profession as it was represented by more than 200 delegates at the national convention of the American Institute of Architects.

What is the work of the architectural profession? What are its obligations to client, public and self? What is its goal, and how is it to be gained? What is the Institute? What are its duties to the public and the architect? These questions and many others are suggested by the proceedings of the convention. They remain undetermined, and there are as many opinions expressed and inferred as there are answers.

The convention consumed the time allotted to it; the delegates gave varying degrees of attention; those with special suggestions and recommendations from their local chapters presented them; they were considered in correct parliamentary form, but what does an analysis of the work accomplished show? Have architects, the country over, a clearer idea of their professional duty? Have they been given the feeling of renewed confidence and courage to attack their problems in a vigorous, straightforward way? The answer must be no. The opportunity to make this possible was present; delegates from every section of the country were in attendance, fresh from actual contact with today's conflicting conditions; but the will, machinery or whatever is necessary to bring constructive ideas from such an assembly, was lacking.

Why does such a condition exist? There is one outstanding reason—conservatism of the most deadening variety. The world is entering a period probably greater in potential influence than any previously recorded in history. It is to be a period of great economic development, in which material resources, executive and keen professional ability will be highly important factors. Will conservatism supply the energy and power to cope with forces of this character? Conservatism is satisfaction with conditions as they are; it provides a comfortable prop in the way of precedent on which to lean when conditions requiring a decision arise. It is a safe and comfortable path to follow in normal times, but it is difficult to associate it with progress, and progress is the keynote today. Conservatism will not furnish the answer to questions arising now, nor those that will arise in the next decade. The professional body, business association or individual lacking the courage to solve today's problems in the light of today's conditions, will fail.

Individual architects, to a large number, can be named who are meeting present problems in a manner that commands the utmost respect and admiration. But must the Institute lag behind in the path blazed by the individual practitioner? The Institute should represent the collective ideas of the progressive leaders in the profession; it should not be relegated to a position of following on the heels of progress. It should and must lead! Otherwise the burden of doing the work for which the Institute is organized falls on the individual or small group of constructive thinkers. The individual can and will assume the burden; he will make his own decisions that seem best in the light of local conditions. But is this policy going to strengthen the Institute? The great mass of architects look to the Institute as their guide—their inspiration. If the Institute has not the courage to fill this role, its usefulness as an aid to the practicing architect is greatly impaired.

Of what particular interest, therefore, is a chronological review of the convention proceedings?

There is little to record that may be described as actual progress; a resume of almost any previous convention would serve nearly as well. The ancient topics of competitions, architectural education and improvement of public taste were given their usual prominence; similar proposals were made and similar resolutions passed as in previous years. On the other hand, topics of vital, current interest are limited in debate, and in the end generally referred to the Board of Directors, which always genially accepts, for consideration or burial, any proposals too weighty for the delegates to discuss to a conclusion.

We will take this occasion to point out a few of the opportunities the Institute should seize to build up a professional society with which it will be necessary and desirable for every capable architect to associate himself. It is not our purpose to indulge in captious criticism, rather is it to exercise our editorial function — to hold the mirror, as it were, so that some observations may be expressed that, in the nature of things, are not so easily evident to those within the organization.

We have said that the proceedings of the convention suggest the question, "What is the Institute"? The founders of the Institute organized themselves to uphold and improve the standard of architecture as a fine art, and to aid themselves and other architects in developing a professional pursuit on a high ethical plane with intelligent and capable service to the public.

If any one characteristic of the convention were to be singled out as indicating the trend of thought today it would be the desire for power and the recognition of its possession, on the part of the public. This in itself is not to be criticised in an organization where power is used in furthering public service, but the Institute appears somewhat impatient over the comparatively slow process by which public recognition is acquired, and there are consequently definite tendencies of a desire to force more speedy recognition. This is, we think, frankly a mistake. Recognition will come in full measure to any individual or group that makes a sincere effort to deserve it, and any attempts to secure it otherwise are likely to result in retarding the movement.

We fear that some of the fundamental purposes for which the Institute was organized are being lost sight of, due undoubtedly to the disturbed economic conditions under which we labor today. Thus the Institute in some of its own activities, and in its endorsement of other activities inaugurated by groups of its members, is becoming involved in ventures which are purely of a business nature. Business ventures may, of course, be perfectly honorable and legitimate, but in the very nature of things they entail the adoption of policies which cannot always be found compatible with the basic reasons underlying the existence of a professional body founded for the improvement of its members and the upbuilding of an art.

We refer particularly to the recent organization to provide plans for small houses to people throughout the country, who, statistics seem to prove, know little of the architect's work and seldom if ever employ him in solving their modest problems. For the past few years this problem has been bothering certain men in the profession, perhaps stimulated into crystallization by the experience of many in war housing. There is a definite phase of public service to the proposal that is most worthy of support, but we feel that in response to this urge a somewhat ill-considered program has been definitely adopted. In short, the public service angle has been merged with a plan which is purely business—with stockholders, subsidiary corporations, regional directors, a parent corporation and all the paraphernalia that goes along with the modern idea of "big business"—the whole given an excellent assurance of business success by the endorsement of the American Institute of Architects. The plan, carried to a logical and possible conclusion, means the control of a very large part of the small and moderate cost work of the country by a large national corporation, allocating work to some nine regional subsidiary corporations. The source of any art thus produced will be the corporation, the individual designers who conceive the plans being recognized only in the published lists of stockholding members.

Wholly aside from the theoretical propriety of the Institute embracing activities of a business nature, is the larger aspect—the reaction on the profession at large, and the effect on the Institute in its function of developing the smaller practitioner to a point of high standards in both art and service.

We have, therefore, immediately a reversal of policy. Architecture has always been considered a personal art; it emanates from a designer who must be an individual and should be an artist. Small house architecture is, however, evidently an exception—it can be produced by a corporation, and it is claimed that the man who secures his modest architectural service through the corporation will gain a clear idea of the *architect's* function, and that when he prospers and has need for a larger home or a new business building, he will consult an individual practicing architect and employ him on regularly accepted professional terms!

The psychology does not seem quite clear. He will more probably consult the architectural corporation, and if it is not in a position to render him service he will be inclined to question the discrimination. He has been educated to stock architectural service, over the counter, and will search out some other corporation or service that has no limitations.

The housing bureaus are definitely in the "stock plan business." They undoubtedly will provide more complete service, and probably a better grade of design than existing agencies, but the success of the movement depends entirely on business considerations—involving extensive publicity. This



The less familiar view of "bowling green," gardens and buildings seen on looking toward the river



AIRPLANE VIEWS OF "MOUNT VERNON," NEAR WASHINGTON, D. C.

Few large estates of present-day development possess the informal symmetry and colorful patterns of terrain that George Washington's home on the Potomac spreads before the aviator. Notably beautiful on the ground, it could hardly have been more pleasing if anticipating the view from the air.

Photographs by courtesy of the U. S. Army Air Service

will be possible only by the aid of large capital, which obviously the return from sales of plans will not provide. Arrangements with building material manufacturers, who have large distributing channels, therefore become necessary. They will be actuated by either the aid the plans will afford them in merchandising their products or the possible direct return from sales of the plans themselves. The architects making up the personnel of the various bureaus, and incidentally the Institute through its endorsement, thus become definitely allied with a commercial enterprise which is a departure from purely professional grounds.

Another phase which is of concern to the Institute, is the reaction upon it of large numbers of young men in the profession who are dependent for the start of professional careers on just such work as these corporations will take care of. These young men, on the whole, are doing creditable work. Each in his small sphere of influence is spreading the gospel of better architecture and, furthermore, he s creating a visible expression of the real service of the architect—the work of an individual designer who s able to interpret the owner's needs into actual building form with some degree of taste. While it is correctly contended that this plan service will reach people who, because of remote locations, could not possibly be served by architects, there is no means of confining the service to them and the plans will, in perhaps larger degree, be used in the suburbs of cities where innumerable young men are available for architectural service. To develop an architectural practice is not an easy problem, and for many it will not be made easier by a network of architectural corporations covering the country that propose to supply "complete architectural service" at a price with which the individual architect cannot possibly compete.

We do not wish to underestimate the public service which is the underlying principle of this plan, but there are numberless ways in which this angle could be approached whereby those now not served by the profession could be given advice and plans at low cost and the field which is now being well served by the young architect would not be jeopardized. The young man working earnestly today is future timber for the architectural profession and the Institute, and he should be accorded every recognition and help; certainly no step should be taken by the national organization that might frustrate his efforts. The position of architecture in small work is not fundamentally bad; recent years have seen a tremendous advance in the standards of taste of the small home builder, for which the enthusiasm of individual architects and the live influence of their work have been responsible. This will steadily grow, and it is safe to say that it will eventually build up a more truthful and vigorous expression of America's taste in home building than artificial and hurried methods employed in corporate effort could ever do.

One feature which was a departure from late convention precedent requires comment. This was the provision of a place in the program for the discussion of subjects pertaining to design, and judging from the very full attendance these meetings enjoyed, in contrast to those dealing with routine matters, it would be distinctly worth while to continue them in future conventions. An opportunity was available, at the end of the lectures, for general discussion which was widely participated in and brought out points of decided interest and value. Harvey W. Corbett, of Helmle & Corbett, lectured upon the subject, "Planning High Buildings for Narrow Streets," and illustrated his talk with interesting slides of the newer tall buildings in New York designed in accordance with the regulations of the Zoning Law, which have been instrumental in changing completely the principles of design of office and other high buildings. The law, while not perfect, is at least working to the advantage of architecture, because it has forced the consideration of the tall building in three dimensions instead of the two dimensions of a street facade, and as a result some very interesting solutions of the tall building problem may be expected in New York.

Other illustrated talks were by George S. Howe on "The Minor Architecture of France," and by Charles Z. Klauder on "Recent American Collegiate Architecture," which afforded very convincing evidence of the high standard of design that has come to characterize Amer can colleges. These talks injected an element of inspiration that was not lost on the delegates. They were particularly of interest to architects from parts of the country where large opportunities for architecture have not yet been developed; through their membership in the Institute these men could feel a definite contact with the larger work and carry away with them a determination to take the greatest advantage of the opportunities that are afforded them.

This should be the keynote of all convention work. The Institute must provide the inspiration that will prompt the individual to make his service better from the angles of both design and business service. Opportunity should be given for the discussion of problems as they arise in practice, and action looking to the formation of policies should be taken at times when such action will be of most benefit. There is too evident a reluctance to deal with questions that require decisions; action is apt to be postponed to a time when conditions may be quite different and the decision of little value. The Institute must come to the realization that in its hands is placed the welfare of the architectural profession. It should adopt a progressive, alert policy that will establish it definitely as the leader of the profession. This accomplished, its membership will grow; the satisfactory increase of 700 members this year will be repeated again and again with little effort; its influence will extend to every section of the country, and the power and recognition it desires will be forthcoming in full measure.

Villas of the Veneto

III. THE VILLA BERCHET, ON THE TERRAGLIO, NEAR MESTRE

By HAROLD DONALDSON EBERLEIN AND ROBERT B. C. M. CARRÈRE

THE whole of the Veneto, so far as villas are concerned, is a thoroughly Palladianized country. Probably nowhere else, either within or outside of Italy, can a region be found in which the dominating influence of one man is more clearly to be traced in all the manifestations of rural domestic architecture.

It should not be inferred from this statement that all the country houses that may lay claim to any degree of architectural merit were designed either by Palladio or by those of his contemporaries or successors who closely followed his manner or precepts. But Palladio supplied the initial impetus, under divers phases of which villas continued generally to be built for two centuries afterwards and, indeed, to some extent, down to the present day. Not a few of them show sadly feeble and meager use of Palladian principles, it is true, but notwithstanding their manifest shortcomings one who is willing to analyze their compositions may discern back of it all a Palladian concept.



Andrea Palladio, 1508–1580

In other words, Palladio created the background, and upon this background his successors have wrought, sometimes well and sometimes unsuccessfully, according to their lights or according to the trend of current fashions. The architects of the baroque age, with characteristic assurance, did whatsoever they listed, and they embodied features of composition and methods of detail that would have driven Palladio, with his regard for archæological rectitude, to rage or despair.

But notwithstanding the florid creations of the baroque architects and the elaborations of Count Fregimelica, or those of his less gifted and less known contemporaries, it is evident that one and all followed along a well beaten path of which the course had been determined by the original Palladian trail. It matters not whether for examples we turn to the lordly palace of the Pisani, at Stra, or to the lesser villas, shooting boxes, and farmhouses along the Canale di Brenta; whether we pursue our course along the Terraglio towards Treviso, or whether we search the country in the directions of Castelfranco or Vicenza; whether we scan structures that command admiration for their excellence, or whether we contemplate architectural trivialities that disclose Palladianism run to seed, more and more does the conviction force itself upon the mind that Andrea Palladio laid the broad foundations of a generic style, which those who came after him have modified in varying degrees but have never wholly obliterated. Consequently, the inter-relationship of rural architecture in the Veneto is just as distinctly and locally characteristic of the region, and just as unmistakable, as is the clearly marked local relationship between the villas of Tuscany.

To understand how it was thus given to Palladio to lay in the Veneto a comprehensive foundation for rural architecture, a foundation that served to influence profoundly its whole subsequent development; how it was that he was privileged to chart, as it were, upon a clean sheet, a course that his successors found it expedient, in the main, to follow, we must bear in mind two controlling considerations. In the first place, the condition of the mainland in the Veneto, prior to the sixteenth century, had not been such as to invite the establishment of villas. Turmoil had prevailed almost without cessation, and the territory had been sadly harassed through the pillage and destruction attendant upon the strife of warring factions. Many of the holdings of great monastic houses, in the possession or under the feudal protection of which much of the land was formerly held, had been laid in ruins, and for hundreds of years afterwards, when fields were ploughed or foundations being dug, it was no uncommon thing to uncover bits of mediæval sculpture that had once graced buildings thrown down in the ages of violence. Thus the field was ready for the creation of an entirely fresh villa tradition. In the second place, with the coming of more settled conditions across the lagoons, and with the development of that wonderful system of canals that reclaimed large areas of fen

country, the Venetians turned their thoughts thitherward and entered upon that course of building which was to bring forth some of the stateliest villas in all the north of Italy. To this experiment in the establishment of villas they were impelled not only by the invitation of a now secure and peaceful countryside, but also by a freshly awakened passion for the enjoyment of nature's charms, an impulse traceable to the all-pervading influence of humanism. The same influence led them to plant goodly groves and gardens where, in a congenial and appropriate setting, they might re-enact the polite and intellectual refinements of the Greek Academy.

In their enthusiasm for the "new learning," and prompted to imitate with a sort of amiable and harmless pedantry the manners of the ancients, the physical realization of their ideal demanded two things. There must be parks and groves of adequate size for entertaining, and the houses themselves must be sufficient to accommodate numerous guests and a retinue of servants. It was customary for the guests to come and spend at least several days; often they remained longer. Hence we find a series of salons and card rooms where, in the evenings, the guests might move about and divert themselves as their inclination led them.

When we remember that ordinarily many of these villas were occupied by the masters and their friends during the autumn only (the bailiffs, gardeners and *contadini* presiding there the rest of the time), and that this brief occupancy was a season devoted mainly to extensive entertaining, and entertaining very often carried on in a somewhat ostentatious way, we can understand the lack of a certain domestic quality in these country houses. That domestic quality they doubtless would have had, at least to a far greater degree, if they had been used as homes during a large part of the year. A somewhat modified interior arrangement would inevitably have obtained. As it was, the more purely domestic qualifications did not loom with large importance and, judged by the domestic standards to which we are accustomed, they must needs present a somewhat artificial and, at times, stilted aspect to one in quest of domestic values.



Entrance on Long Facade of Sculpture Gallery

The gardens too, full of delight and stately beauty as they often were, reflected the same underlying trend of insistent formality. There were long pleached walks, great expanses of lawn, systematically disposed avenues, imposing stretches of well regulated woodland, fish ponds and streams confined within carefully ordered bounds; casinos, grottoes, urns and statuary, set to terminate vistas, to yield a note of contrast, or to give due accent to some feature of the gardening composition. Order, the formal massing of luxuriant foliage, and the divers qualities of leafage were the chief elements of charm.

The flower garden was often merely a utilitarian adjunct to afford the requisite supply of cut blooms and was not, as it was in the average Tuscan villa, a spot of intimate delight, a veritable outdoor living place and inseparably associated with the house itself, whatever other features of more extensive planting and garden layout there may have been in addition.



VIEW OF SOUTH FACADE FROM OLD DRIVE



GENERAL VIEW FROM STREET

THE VILLA BERCHET, NEAR MESTRE, ITALY



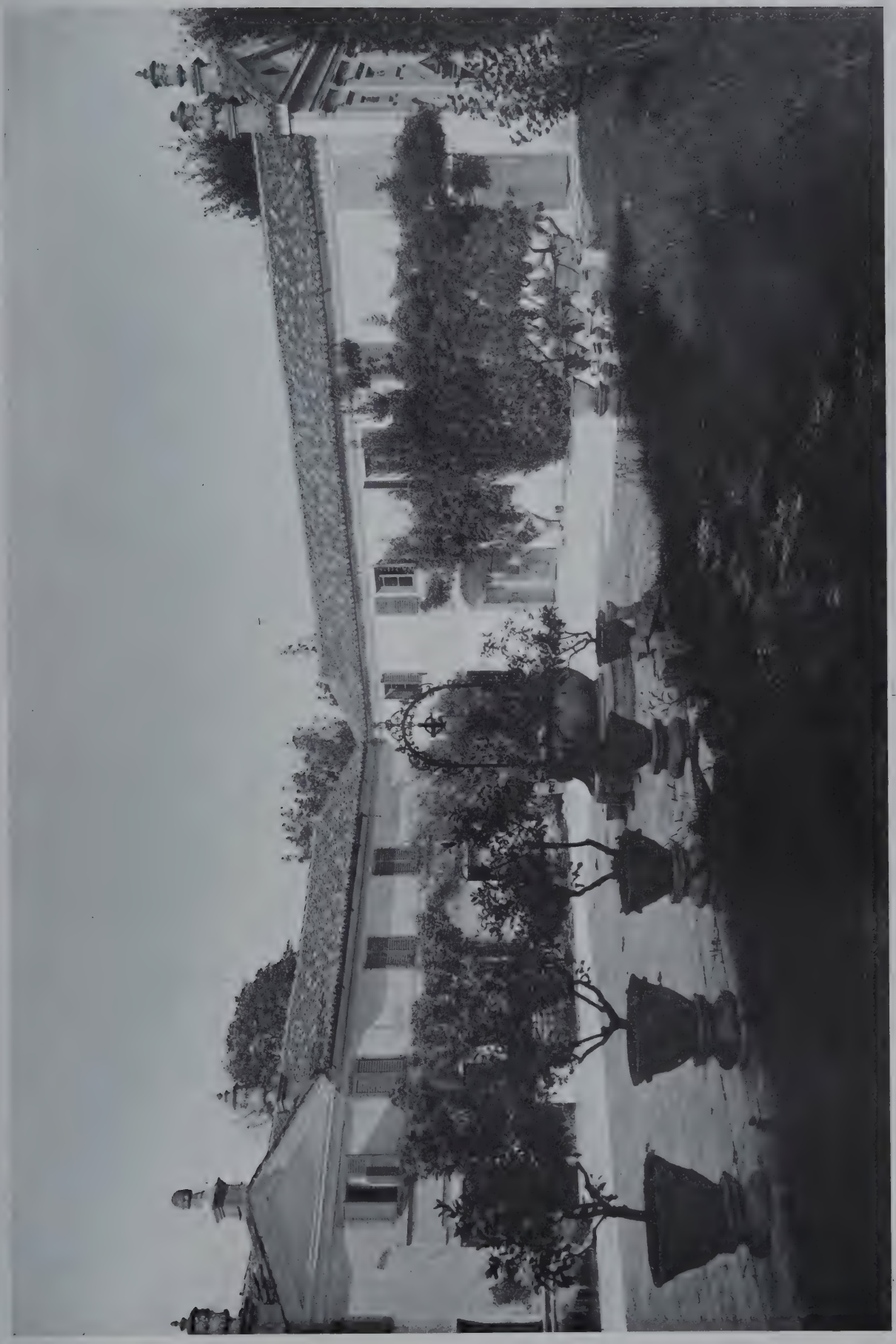
End Facade of Minor East Wing

Such were the requirements of the clients for whom Palladio and those who came after him were called upon to design villas—a task thoroughly congenial to the temperament and ideals of the great architect, we may well believe, and no less congenial to his successors. Without an adequate understanding of these conditions, and of the comparative permanence of the requirements which made it possible for the Palladian tradition to continue with such vitality, we should be in danger of misinterpreting all the villa architecture of the Veneto. Having formed this concept of the mode of life these villas were designed to accommodate, we may now address ourselves to the Villa Berchet in particular.

Though in general style quite representative of what was best in the work of the later period, the Villa Berchet is distinctly unusual in its plan, and herein lies one element of special interest. By a very irregular and asymmetrical scheme of massing, the several continuous parts of the structure are grouped about three sides of a large stone-paved *cortile*, while a part of its west side opens out into another, smaller and narrower, that extends bay-wise into the western block of buildings and does duty as a flower garden. Thus, in two respects, there is a wide departure from the original usage of Palladian tradition, in the chain of which the Villa Berchet forms a late and exceptional link. The plan, besides being asymmetrical, is apparently more or less fortuitous, and the *cortile* occurs as an integral feature of the scheme.

A study of the plans of villas designed by Palladio himself, and a comparison of the majority of those throughout the Veneto designed by his successors of various dates will show, for one thing, a most punctilious adherence to the principles of balance; when it was found inexpedient or impossible to make the two corresponding parts of the plan on opposite sides of the main axis exactly balance each with the other in internal arrangement, as was frequently the case, the exterior, at least, exhibited a symmetrical disposition of parts on each side of the central features. It may be observed that although Palladio in designing villas time and again made use of wings projecting forward from the central block of his composition, the space partially enclosed in this way could not strictly be called a *cortile* in the sense usually conveyed by that term, and it was his wont to plan the main portion of the house as a solid block. The great central hall or *sala*, which he customarily employed, took its place, and this central hall—according to Venetian use, lighted by massed windows at the ends, while the rooms opened from each side, thus in effect serving in lieu of a *cortile* where ground in the city was too precious to be given over lavishly to open spaces—was a local tradition strongly enough established to induce later architects to adhere to it.

The explanation of the fortuitous plan of the Villa Berchet is probably to be found in successive dates of construction, the formal front of the east wing and the urn-topped pediment of the long block at the back of the *cortile* being subsequently added to bring this rambling assemblage of older buildings into measurable conformity with the architecture of the more studied west wing that abuts on the highway. Be that as it may, both the composition and the general aspect of the buildings embody appreciable elements of charm, and although there is little in the plan, considered in detail, to commend it for modern adaptation, the ensemble is not without considerable value.



NORTH AND EAST SIDES OF LARGE CORTILE
THE VILLA BERCHET, NEAR MESTRE, ITALY



Main Floor Plan

Agreeably to the custom of the country, the walls are of brick coated over with stucco and the roofs are of reddish tiles. The stucco, in this case, is of a gray hue, the shutters are green, the vases adorning the roof are of terra cotta painted the color of the walls, and the empaneled bas-reliefs are painted the same, thus bringing the building into color unity.

The treatment of the south and west fronts of the main portions of the house is interesting and ingenious; across each facade there extends an order of pilasters with the entablature interrupted by the slightly recessed bays, so that what are actually sections of architrave, frieze and bed-mould appear to be imposts upon the capitals of the pilasters. The vases upon the roof continue to carry the eye upward and give sufficient vertical accent to prevent the building from appearing squat. Of course the whole scheme simply exhibits the ultimate adaptation of structural members to a purely decorative function and, according to all puristic theories, it should be reckoned thoroughly heterodox. Nevertheless, though theoretically indefensible, it is a clever bit of composition, and an effect that has been so adroitly managed once might well be repeated without anyone being the worse for it.

The ruffled critic will find more consolation in



The South Facade of Sculpture Gallery



EAST WING FROM THE LARGE CORTILE



CENTRAL PORTION OF LARGE CORTILE

THE VILLA BERCHET, NEAR MESTRE, ITALY

contemplating the south end of the east wing—a part of the house that has served by turns the purposes of billiard room and laundry—and still more mental balm and delight in viewing the casino or rotunda, the glistening white walls of which flash out from the dense green of the long *viale* of overarching limes. The garden setting corresponds, in the main, to the general description of villa grounds which has already been given. The casino once faced upon a broad lawn, but during the recent war this was ploughed up and planted in corn and has not yet been restored to its original condition.

Many of the most interesting villas of the Veneto escape the attention of students, or those in quest of inspiration, by reason of their being far from the beaten highways. These villas have been overlooked or else forgotten by the writers of guide books or the authors of histories of art, and even when their existence is known it is not always possible to find them, because even in one Italian province there may be several tiny hamlets having the same name. Writers on the villa architecture of Italy are apt to devote their attention to the more important examples, but the minor villas stand in close artistic relationship to their larger and more sumptuous neighbors, and prove that large and small alike were often designed or inspired by the great architects of the renaissance.

The architects of this period possessed in a high degree the happy faculty of being able to provide a setting both suitable and beautiful for the life intended to be lived within their villas, whether they were destined to be peopled with the brilliant personages of an ecclesiastical court, with the splendid members of a patrician family, or by the humble members of a *contadini* household, and the skill and ingenuity with which they arranged or disposed their motifs results always in a wide variety of picturesque compositions. Villas of a somewhat minor class are often full of inspiration to present-day architects, for Italian villas of not too great size may well afford models upon which modern country homes may be studied. Their architects intended their villas to be lived in—to be comfortable country houses—and they rarely made the mistake of sacrificing convenience or comfort to architectural interest or decorative effect. Then, too, the materials with which they built were such as might be had today in almost any part of America—brick, for the most part, stuccoed or merely whitewashed for exterior building, and the simplest walls and woodwork within.



Sala Facade on Small Cortile



House of A. C. Ernst, Esq. *Cleveland, Ohio*

"Euclid Golf," Cleveland, Ohio

HOWELL & THOMAS, ARCHITECTS

By HOWARD DWIGHT SMITH

TO one who does not know Cleveland, the term "Euclid Golf" might convey the idea of a more or less interesting game with some form of mathematics combined with the manipulation of balls and clubs. To those who do know Cleveland, with anything more than a mere superficial acquaintanceship, however, the term has an entirely different meaning. To them it signifies a district centering about a wide curved boulevard, crossed by a dozen or so winding streets of generous width, an abundance of fine old trees and a sprinkling of substantial houses which are, as suburban houses go, quite likely in size and character. It is a residential section which has established its high character as a community both from a civic and from an architectural viewpoint, so that a discussion of it as a real estate venture ceases to partake of the nature of commercial advertising, and becomes an item of news value and of common human interest.

There are examples of real estate development where architectural ideals have been maintained, but where financial success has been more or less dubious. There are also examples, only too numerous, which have been of unqualified commercial success but which architecturally have left much to be desired. Hardly a city of any size has not its subdivided suburban districts. A few of these stand out and are recognized among real estate operators as most successful, for one reason or another; among these may be mentioned Forest Hills, L. I., Roland Park in Baltimore, Shaker Heights in Cleveland, and the Country Club district in Kansas City.

The story of Euclid Golf really begins with an interest taken by Mr. B. R. Deming of the developing company in some residential work designed by Howell & Thomas, in the vicinity of Newark, Ohio. This interest led Mr. Deming to consult this firm when he became charged with the task of subdividing a portion of the old Euclid Golf tract. Business and professional relations were based upon the real estate man's confidence that his architects were interested primarily in the expression of certain practical and artistic ideals, and upon the architects' feeling of assurance that the expenditure of funds in development and building would be governed only by a reasonable desire to attain these ideals without extravagance. Consequently, the

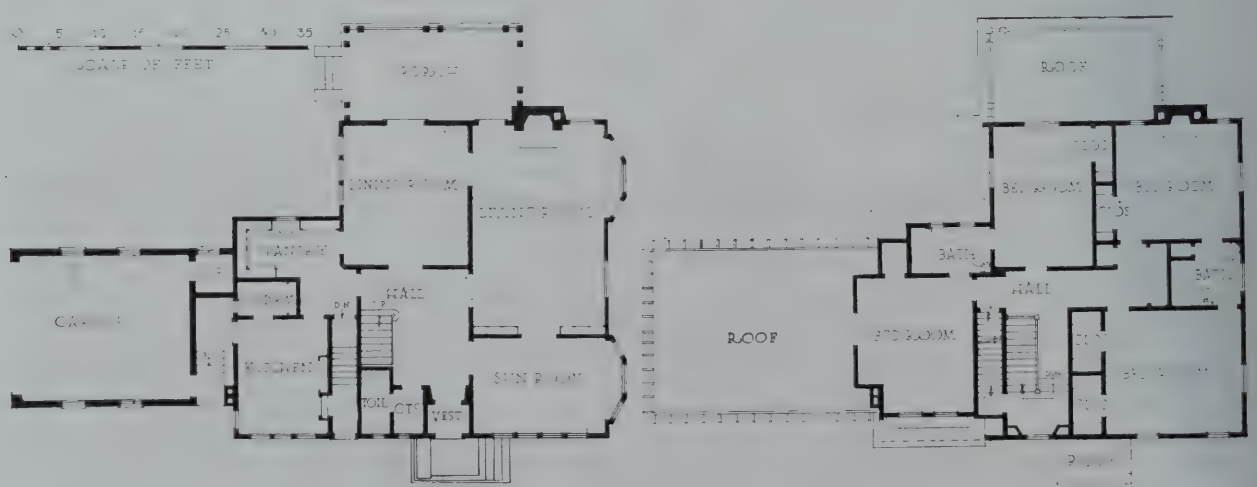


First and Second Floor Plans. House of A. C. Ernst, Esq.

architects' services were sought in the formation of the original general policies and in the discussion of ideas and schemes. The Euclid Golf Allotment is possessed of great natural beauty to begin with—plenty of old trees, as these illustrations testify, and of just sufficient variation of levels at its entrance to set it well apart from the surrounding territory. The layout of boulevards and drives has been made with a view of making the most of these natural advantages, and of providing sufficient variety of streets and roads to give interest, but to avoid the labyrinthine confusion which usually results from an effort to give every thoroughfare in a new suburb interest and individuality by devious windings. The possibilities of the Euclid Golf site were studied and the layout made accordingly, and the original building restrictions were drawn up with a view to establishing a censorship, which has usually been regarded by real estate men as a doubtful proposition. Having determined the most advantageous street locations, this censorship has been exercised on building operations to insure the continuation of the policies established.

House restrictions in Euclid Golf vary according to locations. The aim in establishing these restrictions has been to keep the character of the neighborhood up to the highest standard, and yet to have restrictions that permit the kind of development which increases land values. One restriction provides that "all houses built in Euclid Golf shall have plans approved by the company." In making this restriction the aim has been to assist the home builder rather than to limit him. Those who build good houses under these restrictions, homes which are the result of study and careful thought, have some assurance that neighboring houses will not only represent a certain minimum of investment but will also harmonize with the established character of the streets and their general setting. The sincerity and intelligence with which this censorship or supervision is applied is the measure of its success. Lax or biased application of such a provision has spoiled the architectural possibilities of more than one subdivided district.

The quality of service rendered by the general study of the chief problems of the Allotment as a whole may be well illustrated by the story of Mr. Deming's own home. This house, which was published in THE FORUM for May, 1917 was built from plans which were developed from some origi-



First and Second Floor Plans. House of W. R. Mitchell, Esq.

nal studies made to show Mr. Deming that there were some interesting architectural possibilities even in a certain discarded strip at the entrance to the Allotment—an irregular strip some 500 feet long, not over 40 feet wide at its widest point, and dropping off from the boulevard into an abandoned quarry. An interesting succession of rooms on various levels, a small dam in the quarry rill, overhanging bays and a long, narrow garden strip, with an exterior dress of stone, stucco and half timber, which combines some Tudor and some mediaeval traditions of the north of France, have produced a quaint continental charm which straightforward, simple domestic examples rarely possess.

The restrictions placed upon building in Euclid Golf are perhaps no more rigid or stringent than those in vogue in many other subdivided areas. Valid restrictions, those which are incorporated into contracts for the sale of lots, and which can be properly enforced, are quite common. First and foremost, a building line restriction is always recognized as necessary; a minimum cost restriction is perhaps the next in importance. In some residential sections there is an effort to restrict the character of buildings to single dwellings and to limit the minimum of lot frontage for any building. Permanent easements of certain widths on the sides of lots permit the location of service lines elsewhere than on the thoroughfares and prevent structures being built up to the lot lines.

These restrictions are productive of much good. They insure fundamental things to a community and make investment reasonably stable. The addition of a restriction which gives a real estate company the censorship of any set of plans is of doubtful value unless it is rigidly enforced, and unless some carefully studied scheme guides all decisions in giving or withholding approval. A home owner who has the minimum amount invested in his property, in a modest but attractive cottage, must be protected by the company in some way from having an expensive, large sized structure built on an adjoining lot, and this protection must be forthcoming even at the risk of losing a valued prospect. On the other hand, one who chooses to build a large, expensive and attractive house on any given lot should be protected from the minimum price builder who might build on adjoining property. Then, too, certain restrictions which tend to uniformity or harmony are of importance when properly enforced. The well known requirement of a red roof at Forest Hills Gardens has produced a uniformity of color which has not interfered in the least with interesting variety of architecture. The value of this particular restriction is emphasized by the striking contrast with the nondescript character of adjoining tracts, where less idealistic restrictions have obtained. No such special restriction has been attached to the sale of land in Euclid Golf, but that requiring the approval of plans by the Allotment Company has been upon the advice of Messrs. Howell & Thomas, who have been governed solely



House of W. R. Mitchell, Esq., Cleveland, Ohio

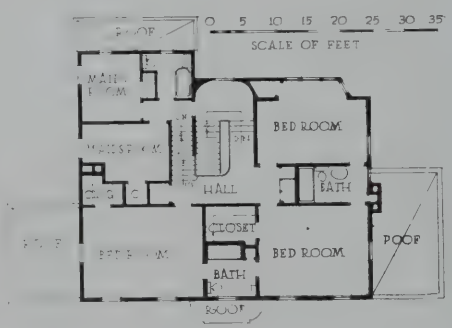
by the thought of establishing harmony and reasonable variety in each of the particular localities.

At the risk of appearing arbitrary in the dictation of style and character for any particular locality, the B. R. Deming Company early in the development commissioned Howell & Thomas to design certain houses for the purpose of setting standards for various portions of the Allotment. We find, therefore, in different sections, such houses as the large Lutyens type of English house now owned by A. C. Ernst on the large and important corner lot on the Allotment at the junction of Fairmount boulevard and Ardleigh drive, or the rambling New England colonial frame for Mr. R. G. Pack on a 160-foot inside frontage on Tudor drive. Houses of a smaller type, such as the New England gambrel roof cottage for W. R. Mitchell on a 70-foot inside lot on Woodmere drive set standards of simplicity and excellence which can be pointed to with reasonable pride.

The establishment of a style in any group of houses, or in any group of buildings for that matter in this day of eclecticism, is a difficult matter because of the great allowable latitude. Ease and facility of construction in any material with few structural restrictions make it possible for us to use exterior dress of almost any style regardless of its significance, and regardless of the restrictions which might have governed the original use of any style. By way of illustration, let us consider a single example of the influence of structural restriction on the development of a style. In the Cotswold district in England, heavy local stone has been used for walls and stone slabs for roofs for centuries. The limit placed upon the lengths of roof timbers to support the weight of these heavy roof slabs placed a certain limit on the widths of rooms. Present-day structural methods eliminate practically all local restrictions, and this makes possible the use of a variety of styles and a diversity of character in any group of buildings which may be fatal to its harmony and restfulness if not properly controlled. Subdivision restrictions which permit the erection of a frame colonial, a Tudor half timber, an English stone and stucco, a Spanish type, a Georgian and a mission style building on as many adjoining 60-foot lots allow the violation of a principle of harmony which is just as valuable to the orderly development of a residential tract as is a uniform building line. The setting of high standards and the living up to them are factors in Euclid Golf's success as a high class residential subdivision.



First Floor Plan



Second Floor Plan

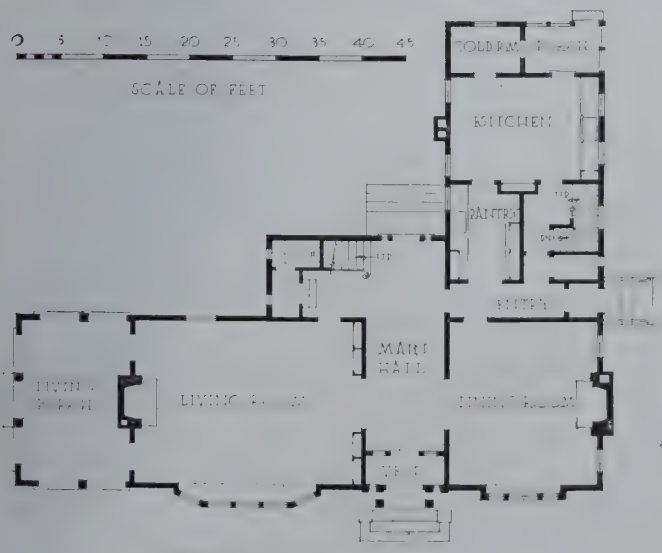


House of Colonial Type, Known as "Shingled Westover"

Consideration of some of the individual houses of the group will help in forming an opinion of the success of the work from the architect's point of view. The house for Mr. Ernst represents, perhaps, the boldest financial venture of the entire Allotment. Here is a house covering an area of approximately 3,500 square feet and having a cubage of approximately 135,000 cubic feet, exclusive of garage, which was designed and fairly on toward completion before a client entered into the proposition. To many practitioners the thought of erecting a residence of such proportions without the restraint or the spur of a client would seem like a bold venture indeed. In the house



ENTRANCE FRONT



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF R. G. PACK, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS



GARDEN FRONT



GENERAL VIEW

HOUSE OF FRED NICHOLS, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS



VIEW FROM GARDEN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



DETAIL OF ENTRANCE FRONT

HOUSE OF FRED NICHOLS, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS



VIEW FROM STREET



SECOND FLOOR PLAN



FIRST FLOOR PLAN

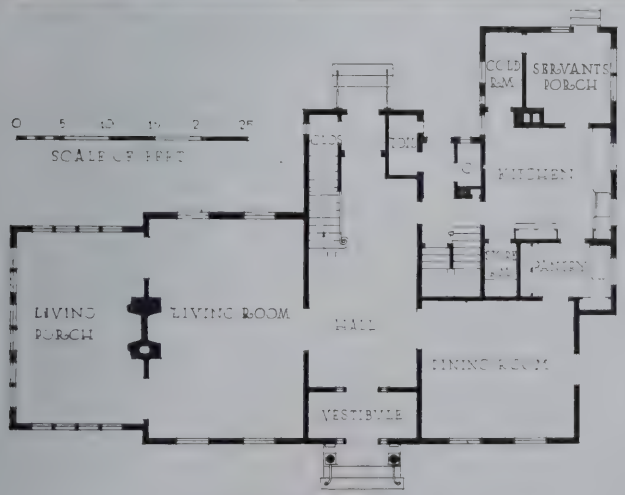


GENERAL VIEW

HOUSE OF THOMAS WHITE, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS





FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF MRS. W. C. SCOFIELD, CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS



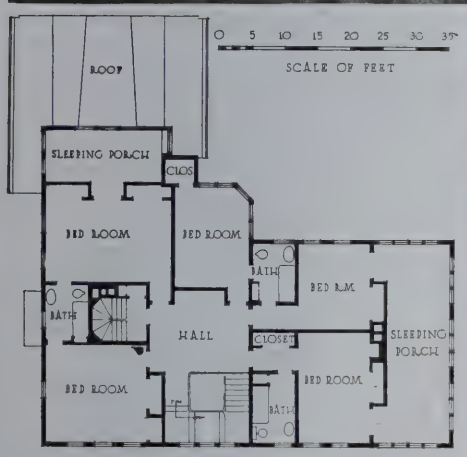
VIEW FROM STREET

HOUSE OF ROLAND W. WHITE, ESQ., CLEVELAND, OHIO

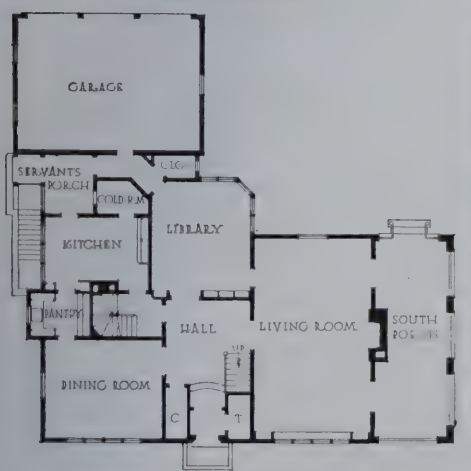
HOWELL & THOMAS, ARCHITECTS



STREET FRONT



SECOND FLOOR PLAN



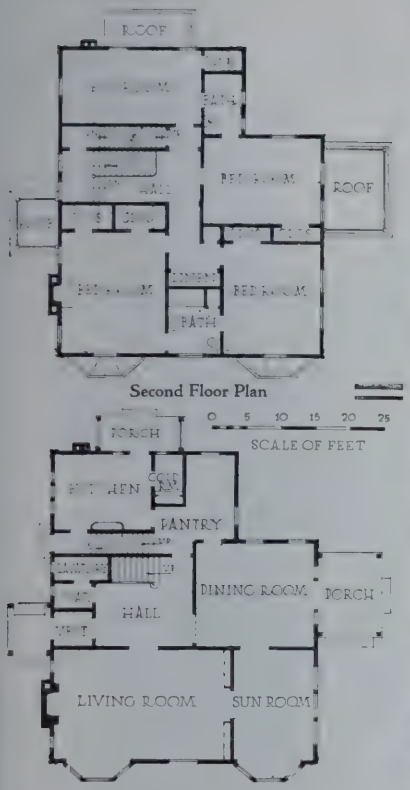
FIRST FLOOR PLAN



VIEW SHOWING GARAGE

HOUSE OF C. A. FORSTER, ESQ., CLEVELAND, OHIO

HOWELL & THOMAS, ARCHITECTS





House of J. C. McNutt, Esq., Cleveland, Ohio

which now bears Mr. Ernst's name the architects have produced an English manor house of the Lutyens type. This style, if such it may be called, represents the best contemporary domestic work in England, possessing originality without grotesqueness and quaintness without faddishness. Here the gables and chimneys and bays are of simple mass; the character of the random ashlar stonework in the walls and the judicious use of cut stone trim are distinctive.

Of only slightly lesser size is the house on Fairmount boulevard at the corner of Woodmere drive, now owned by Mr. Fred Nichols. This house, built in 1916, is also of the Lutyens English type, a continuation of the Tudor tradition. The house is of stone, stucco and half timber and because of its more developed planting it presents a more intimately domestic appearance than the Ernst residence. The plans of these two large houses are somewhat similar in the arrangement of the entrance features in secondary positions, and in the emphasis of the intimacy between the living portions of the houses and the grounds about them. The stonework of the Nichols residence is excellent, warm in color and of fine texture. It is all local material, having been taken from the excavation of a sewer in an adjoining street. The half timber work in this house is not as free in its treatment as is characteristic of the original Tudor work. Perhaps here the restraining hand of economy has played its part and forbidden the necessary carving upon the verge boards of the gable, and denied the accidental roughness to the vertical lines of half timber.

A goodly number of stucco houses have been built in Euclid Golf. Some are on frame with metal lath, and some on hollow tile and brick. Four of these houses are illustrated. That for Mr. C. A. Forster in Delamere drive is built upon a plan with living room and dining room disposed symmetrically about a center hall, but with a living porch built into the mass of the house on the living room side, which throws the exterior entrance feature decidedly off center. The inclusion of an upper story porch within the mass of a house, in some such fashion as is here accomplished, solves reasonably well one of the hardest problems in residence design—that of locating the sleeping porch; only the difficulty of treating the broad openings of garage doors as a part of any house design is as hard a problem in modern residential work.

The high roof, the denticulated cornice and the heavy stucco quoins, trim and belt course of the residence of Mr. Thomas White in Delamere drive give much the feeling of the minor French chateaux. The interesting asymmetry of the lateral facade, with its huge chimney, large stair window and trellised entry porch, does not detract from the interest of the single axis of the narrow front which faces directly on the street. The emphasis of this narrowness toward the street is doubtless due to the fact that the property has only a 75-foot frontage.

In point of number, the examples of Georgian and colonial houses by Howell & Thomas in Euclid Golf exceed all other styles, and aside from the two rather ambitious English examples already mentioned these Georgian and colonial houses represent the best of the entire interesting group. Four very successful examples represent the colonial style

built in frame. One of these is known to the architects and the Allotment Company as "Shingled Westover." The architects have frankly appropriated the design of the well known James River mansion and translated it into frame and shingles, using the exact composition and proportions with a few minor changes in the main door, and adding an interesting round cornered vestibule and a porch at either end of the facade. The plan is that of a real Georgian center hall house with the stairs at the rear of the hall in a long straight flight to a high landing and a short return to the second floor level. The presence in any group of houses of so conservative and acceptable an architectural composition as "Shingled Westover" gives a tone and sets a standard of character which is beneficial to any community.

The house for Mr. J. C. McNutt, Woodmere drive, presents an interesting combination of plan and elevation. It is of a plain, New England type with narrow width siding and very thin mouldings, as fine in detail as interior woodwork, which was characteristic of the early New England houses. The view from the front gives the impression of a center hall type, with a bay window on either side of the entrance door. The entrance from the street is at one side of the house leaving the center door in intimate relation to the open front lawn. A glance at the plan, however, shows that the center door and one bay window belong to the living room and the other bay window to the sun room—a most interesting use of a type elevation and a readjusted plan.

The house for Mr. R. W. White, Delamere drive,



Second Floor Plan



First Floor Plan



House of A. C. Blair, Esq., Cleveland, Ohio

is of that substantial Pennsylvania ledge-rock colonial that is set so close to the ground that it looks as if it had always been a part of the 175-foot lot upon which it is placed. It is the typical center hall type, with a projecting central door hood so characteristic of the middle states colonial style.

If any choice can be made between the house for Mrs. W. C. Scofield, Fairmount boulevard and Woodmere drive, and the house for Mr. R. G. Pack in Tudor drive, it might lie with the latter because of the very successful handling of a difficult asymmetric composition. Here is a building which includes a sleeping porch within the mass of the structure and a facade which assembles seven different types of



Two Cottage Houses Used to Block Out Surrounding Developments



First and Second Floor Plans of House at Right

openings, including a door, a full length stair landing window, a triple window in the dining room, a five-windowed living room bay, three single bedroom windows and open porch arches as well. This composition depends for unity on the great contrast of its whiteness with the dark mass of foliage about it, upon the skill with which uniform scale has been maintained, and upon its broad expanse of plain roof and straight, continuous eaves. It is a most interesting expression of an asymmetric plan. Another problem in the arrangement of door and window openings was met in the brick house of Mr. A. C. Blair.

Mrs. Scofield's house is the other extreme in its symmetry and simplicity, its facade presenting only two types of openings—the entrance door and one type of double hung, shuttered window. Like the Pack house it benefits by the strong contrast between its extremely white mass and the dark foliage about it. The tree grouping about this house is particularly happy and gives a setting quite befitting the conservative style of the house itself. The shingles of the side walls are almost as heavy as the hand-riven clapboards of New England. The cornice overhang is generous, the rafters are exposed, the chimney whitewashed and the well proportioned Doric portico tells a story of colonial refinement which is interesting and refreshing.



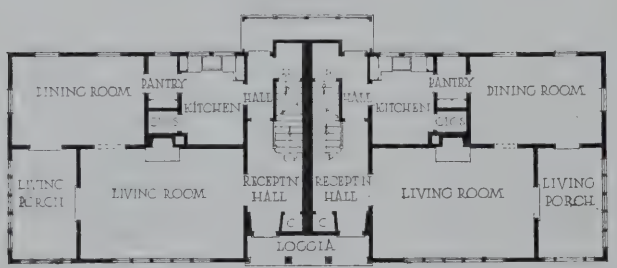
First and Second Floor Plans of House Shown Above

A number of small houses for investment purposes have been built in the colonial character in parts of Euclid Golf. These are moderate priced houses, but they set a standard of excellence worth living up to, and act as an incentive to the home builder.

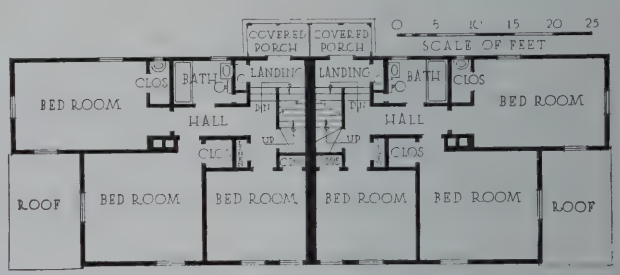
An interesting problem confronted Euclid Golf at the head of Tudor drive. The solution of this problem may be taken as the typification of the spirit which is back of Euclid Golf and which has made it so successful. South of St. James parkway, which forms the southern boundary line of the major portion of the Allotment, there has sprung up a poor class of investment houses built on irregular shaped lots with no restrictions, and presenting an unsightly vista from Tudor drive. The unrestricted lots on the south side of St. James parkway were purchased and those directly at the head of Tudor drive were combined to form the site for a renting two-family house which is illustrated here. The main feature of the front of this double house is the three-arched loggia directly on the Tudor drive axis. This loggia unifies an otherwise bifurcated composition, and places an effective focal point in a screen which protects the Euclid Golf community from just the thing which it has sought to eliminate within its own precincts. On the two adjoining lots the architects, Messrs. Howell & Thomas, have built two interesting little cottages, models of modesty and economy, which add their part to this protective screen about Euclid Golf.

The development of the suburban districts throughout the country may be studied, and it will be found that almost every subdivision which is considered especially successful has been directed by the ability and vision of one personality, which has exercised control over its policies. From the nature of things such a personality is not apt to be the architect's, but in the most successful instances the advice and service of architects have been important factors in the achievement of results. Architects may be regarded as necessary adjuncts, or even as necessary evils, in many cases, but experience with group projects, such as industrial housing and also with larger developments, has fully established the fact that the properly trained architect may be confidently depended upon to produce eminently satisfactory results in group or plot planning, as well as in the actual building.

Too frequently the development of speculative real estate is governed only by business expediency; the results in Cleveland prove, however, that it is both good business and of tangible value to the community for promoters to recognize the special qualifications of the architect and accord him generous and sympathetic co-operation in his work.



First Floor Plan



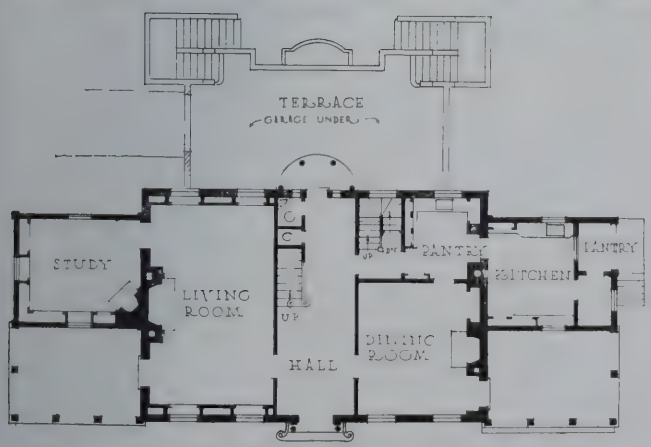
Second Floor Plan



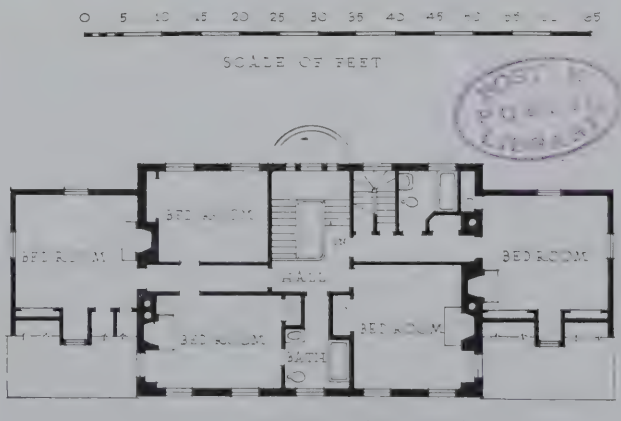
Double House at Boundary of Allotment, on Axis of Tudor Drive



GENERAL VIEW



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF DR. LYNN FULKERSON, FIELDSTON, NEW YORK, N. Y.

DWIGHT JAMES BAUM, ARCHITECT



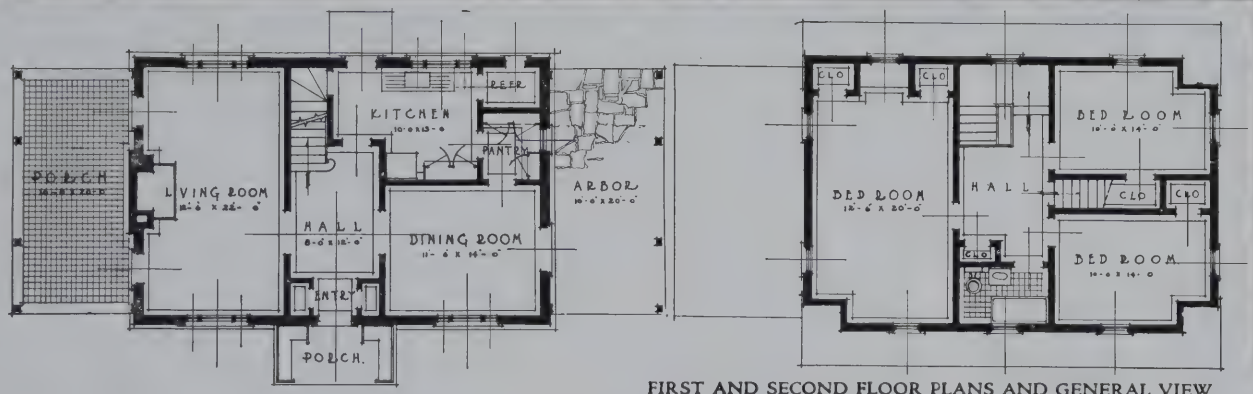


TERRACE AND FRONT ENTRANCES

HOUSE OF DR. LYNN FULKERSON, FIELDSTON, NEW YORK, N. Y.

DWIGHT JAMES BAUM, ARCHITECT





FIRST AND SECOND FLOOR PLANS AND GENERAL VIEW

HOUSE OF GORDON STEWART, ESQ., WHITESTONE LANDING, LONG ISLAND, N. Y.

FRANK J. FORSTER, ARCHITECT





LIVING ROOM END AND ENTRANCE DETAIL

HOUSE OF GORDON STEWART, ESQ., WHITESTONE LANDING, LONG ISLAND, N. Y.

FRANK J. FORSTER, ARCHITECT

DECORATION & FURNITURE

Jeanne Taylor, *Associate Editors*, Leland W. Lyon, R.A.

Mural Painting for Minor Buildings

WITH considerable advantage to themselves and to their clients, architects might well give more consideration to the claims of mural painting as a means of decoration. As applied to domestic buildings, and in fact to moderate cost work of many kinds, mural painting offers possibilities which are well worth encouragement. Because in the past mural decoration in America has been largely confined to use in public buildings, we have perhaps come to regard it as a form of decoration which is suitable only for structures of a monumental character. Many state capitols, court houses, city halls and some churches possess mural paintings, which attest the skill of our artists where large wall spaces afford fitting opportunity for portraying historical events or allegorical episodes, in ways which accord well with their architectural surroundings, but this has resulted in a seemingly prevalent belief that mural painting is an art which, generally speaking, is above the heads of the people.

The minor villas, and even smaller houses, in Italy present many striking instances where mural painting, in some one of its manifold forms, constitutes almost the entire decoration. Many are the airy loggias or halls where such decoration is used, and where it still exists even after long periods of neglect, and fortunately rather more than a mere beginning has been made in the use



Breaktast Room Showing Panels "Spring, Summer, Autumn and Winter." Delano & Aldrich, Architects

in America of this highly architectural form of decoration, which may be adapted to the use of interiors of divers kinds and in keeping with their architectural character.

For breakfast rooms and elsewhere, when bright color notes predominate, mural painting in a high key may be in order. Or again, the mural decoration over the mantel may be the one necessary bright color spot in the room. Similarly, where the desired atmosphere is that of quiet dignity, mural paintings in subdued key and conservative design may be employed. Mural decoration offers to the architect countless interesting possibilities of expression in the decorating of interiors. It may be noted also that the mural decoration is as much a part of the interior architecture as mantels, fixtures and wall finish, and the architect can, by the employment of simple mural decoration, create an atmosphere which will encourage suitable furnishing.



Overmantel at Greenwich House, by Eugene Savage

It was recently suggested by Mr. Chester H. Aldrich, that young painters might well direct their study towards that kind of technique which makes the figure, landscape or marine composition so admirably suited to flat wall enrichment, instead of joining the already swollen ranks of the small canvas colorists. Perhaps equally interesting, however, might be the suggestion to architects of giving commissions to competent mural painters, or of inducing their clients to do so. Such encouragement as is now being given to young sculptors would go far toward bringing mural painting into recognition.



Foyer of Greenwich House, New York. Delano & Aldrich, Architects
Mural Decorations by Arthur Crisp

Decorative Features in a Remodeled City House

DELANO & ALDRICH, ARCHITECTS

IN planning alterations for residential buildings, the ingenuity of the architect is often severely taxed to meet the exacting conditions presented by structures in which the principal lines and proportions have already been established. Of interest, therefore, are a few views of a remodeled city house, in which unusually good interiors have been developed under restricted conditions. It may be noted that this was a five-story residence, the architects' problem being to add another floor, and to develop a building containing three apartments of the duplex type.

The three illustrations which are included here indicate the character of the results which may be obtained by careful study on the part of the architect. A living room, shown as remodeled, has a deep cove at the ceiling with three penetrations on each wall, giving so little plain surface in the center as to appear like a groined barrel vault. This treatment in natural gray plaster, besides suggesting a lower story height, accomplished a stylistic background for a few choice examples of Italian furniture and pictures. Slightly darker than the walls, and of a warm tone, is the antique stone mantel. A mellow light pervades the room by way of five large windows hung with orange Chinese silk in pleasing contrast to the somber taupe of the chenille rug and upholstery velvet. A bloom of age is present on the old walnut of tables and chairs, while a subdued glint of old gold or silver is barely apparent on portions of frames, candlesticks and other accessory furnishings, adding a sparkle in the rich glow.

The octagonal breakfast room shown on page 173 is a unit of this suite and gives an idea of the deviation from wall handling in other rooms which is, however, in perfect harmony. An illustration of the treatment of the hall is given because of its interesting arrangement. The method of concealing the radiators under the windows in this hall is particularly to be noted.

The demands of comfort met here can almost invariably be reconciled with the requirements of good taste, and a judicious arrangement will help to give an effect of dignity and space, even where little space actually exists.



Detail of Entrance Hall in Remodeled House, New York





TWO VIEWS OF LIVING ROOM IN REMODELED HOUSE, NEW YORK

DELANO & ALDRICH, ARCHITECTS

PUBLI LIBRA



BREAKFAST ROOM IN HOUSE ON LONG ISLAND, N. Y.

TROWBRIDGE & ACKERMAN, ARCHITECTS

Grouping of late Italian Renaissance chairs and Spanish table about an early Chinese painting against gray plaster walls. Subdued coloring predominates except for the pair of bright faience jars and chair covering



DINING ROOM, HOUSE AT OYSTER BAY, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

Mural panels in the manner of early eighteenth century pastorals serve to relieve the appearance of austere formality of the chaste classicism



BEDROOM OVER DINING ROOM



LIVING ROOM FIREPLACE

HOUSE OF DR. LYNN FULKERSON, FIELDSTON, NEW YORK, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

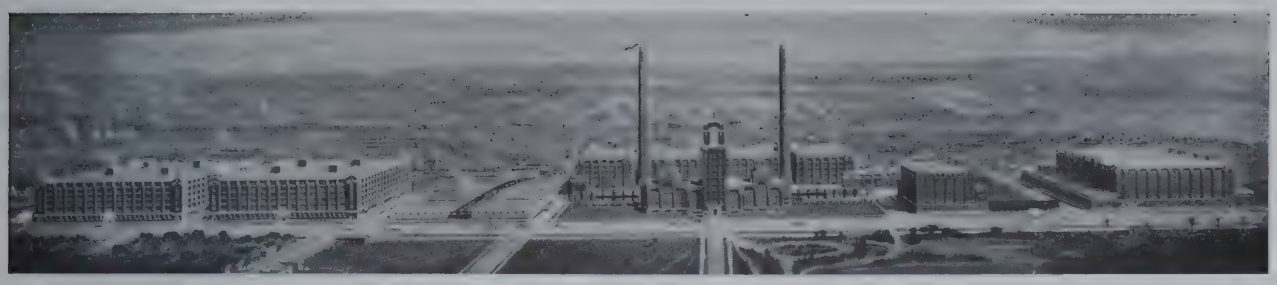




STUDY FIREPLACE AND LIVING ROOM DOOR

HOUSE OF DR. LYNN FULKERSON, FIELDSTON, NEW YORK, N. Y.

DWIGHT JAMES BAUM, ARCHITECT



The Central Manufacturing District, Chicago, Ill.

PART II. ARCHITECTURAL AND CONSTRUCTION FEATURES

By S. SCOTT JOY, ARCHITECT

THE new Central Manufacturing District, the development of which was briefly described in THE ARCHITECTURAL FORUM for April, covers an area approximately one mile square, in the center of which are the tower building and the central heating and power plant. The lower floors of the tower building are used for offices of the District architect, contractors and the construction accountant's staffs, while the upper portion is used for the housing of two 250,000-gallon steel sprinkler tanks which feed the sprinkler lines of all the buildings in this area, thereby eliminating unsightly unenclosed sprinkler tanks on individual buildings.

Adjoining this tower building is the central heating and power plant of the District which furnishes light, heat and power to the buildings, paid for by the owners or tenants of the buildings at a rate equal to that paid by consumers just outside the District. The owners however, and tenants as well, are not continually annoyed with the upkeep and necessary attention required for these plants, and when such an inconvenience as a shortage of coal, for example, occurs in other portions of Chicago, such a need has probably been foreseen by the District authorities and preventative measures taken so that operation of their businesses is not interfered with.

Buildings which are in the area known as the old District, which adjoins the new, are provided with their own individual heating and power plants, but wherever possible towers enclosing the sprinkler tanks are made an architectural feature of the building without entailing a great amount of expense. This supplies another means of avoiding monotony of design. The future plans for this District, and for others which are newly started, are to establish central heating and power plants, together with centrally located sprinkler tanks to supply all the buildings in each District. This decision was arrived at because of the efficient and profitable operation of the plant in the new District, which is to be a model for several others.

It is obvious to one who has visited the Central Manufacturing District that there must be some decided advantage in giving an architectural value to buildings of the warehouse and manufacturing types of which the District is chiefly composed. Several important factors contribute toward the maintenance of the architectural standard of all District buildings. In the first place, the trustees of the Central Manufacturing District, through their industrial agent, request that this standard not only be maintained but improved upon where such improvement is in keeping with practical and economical construction and design. The owners are all high class manufacturers and men who take pride in the exteriors as well as the interiors of their buildings. They are appreciative of the great undertaking which the Central Manufacturing District has begun, and they realize that unification and standardization of their buildings obtain for them larger and better structures than would be at all possible under conditions where each owner demands a building of a design which will suit his own individual taste, regardless of its suitability for its surroundings or of its relations to other buildings.

The architect maintains the architectural standard of these buildings in his designs, and is materially assisted by the high standard of building ideals of both the trustees and the owners. The scheme as originally conceived has been adhered to, and the employment of one architect has made possible unity of design without monotony. The trustees of the District leave the designing of all buildings to the architect, and it is mutually understood that all new buildings will harmonize with the style of architecture already established so that the whole development, when completed, will be distinctive and indicative of its purpose. The manufacturers, upon becoming members of the District, accept the general scheme as it has already been established, and impose limitations on the architect only as to the simplicity or elaborateness of the architectural treatment, which,

in the case of a manufacturer, may give to his business some value in the way of publicity. Due to the assistance of both the trustees and the manufacturers, as outlined here, the architect is given more or less of a free rein to keep his buildings typical of the established style of architecture.

If these warehouses and manufacturing plants were designed and built by individual architects and contractors, in the usual manner, their architectural treatment would show a greater increase of cost over the usual factory design than would be shown by the District buildings. The minimum of cost, the efficient method and type of construction, and the high standard of architectural treatment, all of which are constantly maintained, are secured in the District through a well developed system of operation. The trustees have confidence in the policy of employing one architect, one general contractor and, for most trades, one sub-contractor, to do all the work connected with the District. These organizations, in turn, can well afford to contract for this work on the basis of a much smaller percentage of profit, knowing that the volume of business will warrant such reduction in percentage, when accepting the job.

As in every other architectural design, the handling of kinds and colors of materials plays almost as important a part as architectural proportions in the design of these buildings. The cream colored terra cotta, in contrast with the dark red "Standard District Brick," is used to accentuate the axes of pylons and piers. It is also used for pier caps, and for the carrying through of belt courses, cornices and copings. Polychrome terra cotta is often used for the decoration of the entrances to buildings. The concrete spandrels are frequently painted dark green, which gives a little color to the design and remedies the monotony of a motif too often repeated, besides introducing a subordinate vertical motif to break up the long horizontal lines. The same uses of terra cotta and belt courses occur in practically all buildings, even employing the same profiles of mouldings. Variety is obtained by the different proportions of the pylons and of the buildings themselves, in the breaking up of the coping lines, variety in the details of the ornamental features, and in the treatment of the entrances.



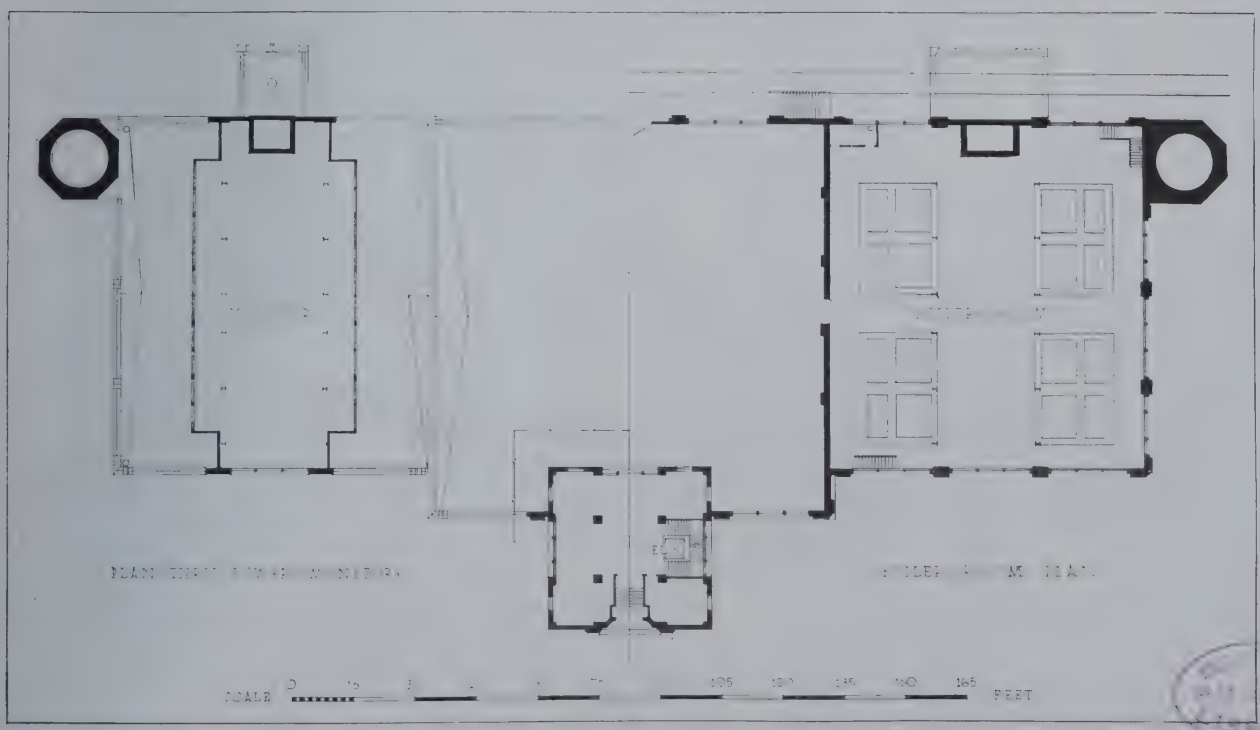
Detail of Clock Tower Containing Offices

There are just two types of construction used—heavy mill, and reinforced concrete, both of which are adapted to the use of buildings for either factory or warehouse purposes. In the case of a factory, part of the building is often used for manufacturing, and part for storage of the raw materials or of the finished product. The designing of these buildings, for use in either of these two capacities, permits the proper adjustment and arrangement of the manufacturing space and also provides for future expansion, which important feature is never neglected. A scheme is developed for each client's entire property so that the unit buildings of each may be built as they are needed, and yet at the same time adhere to and advance the scheme originally conceived.

Mill constructed buildings are usually designed with bays 16 x 16 for laminated flooring for buildings having long, continuous runs of floor, thereby eliminating all the cutting possible. Joists and heavy matched and dressed flooring are used where greater spans and lighter loads are required. Both systems are estimated on for each building, and that is adopted which is the more economical and best suits the given conditions. Girders are always run the short length of a building to permit their erection and the complete framing of the whole floor before the walls are brought up.



GENERAL VIEW



TOWER AND POWER HOUSE, CENTRAL MANUFACTURING DISTRICT, CHICAGO, ILL.

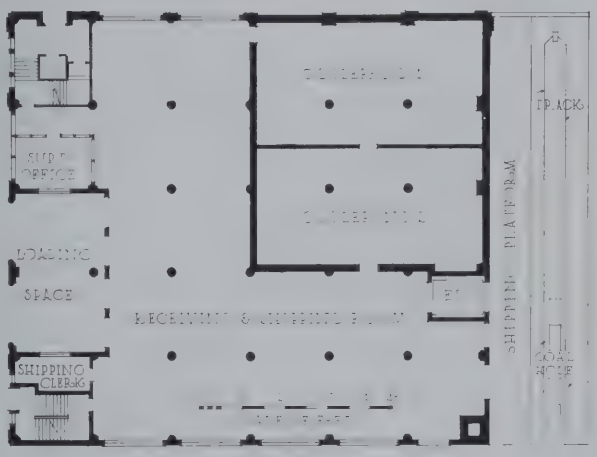
S. SCOTT JOY, ARCHITECT

BUILDINGS FOR NORTHERN JOBBING COMPANY AND WILSON & CO., CENTRAL MANUFACTURING DISTRICT, CHICAGO, ILL.
S. SCOTT JOY, ARCHITECT

Reinforced concrete buildings are designed with bays as nearly square as possible, usually 20 feet each way, for flat slab construction. At the present time when the costs of construction of mill buildings and buildings of concrete are so nearly the same, the concrete construction is invariably used. It permits the light to penetrate farther into the interior of the building, instead of being cut off by deep girders and beams; it facilitates the running of pipes and shafting without hanging them so low that they cut off the head room; it gives the maximum of height for storage purposes and makes possible a decidedly lower rate of insurance, even in buildings that are unsprinklered.



Building for Troco-Nut Butter Company



Main Floor Plan

It is only in exceptional cases that manufacturers require larger bays than those just mentioned, in which cases the live loads are decreased and the bays increased in the direction which allows the most practical and economical use of the lumber as applied to mill buildings. In concrete construction the bays are usually large enough in all cases, but larger bays are obtained where required by carrying the walls and sash on a cantilevered slab projecting 4 feet beyond the outside line of columns which gives 3 feet 8 inches of additional floor space in these outside bays.

Account is taken of the requirements of different kinds of manufacturing processes by variation in the dimensions of the bays as described here, and in the live loads to be imposed on the floors, which loads range from 150 to 250 pounds. The average load on most floors is 200 pounds. Elevators and provisions for the accommodation of machinery are all arranged to suit the requirements of the manufacturer. These special arrangements are such that the buildings can be very easily converted for the manufacture of products other than those for which they were originally designed, when necessary.

Speed of erection is one of the primary factors in the construction of any building, and is insisted upon in buildings erected by the Central Manufacturing District. It furnishes not only an inducement to the prospective manufacturer to begin operation in his new plant at the earliest possible moment, but it also saves for the District the loss of rentals, thereby again giving the District use of its capital for immediate reinvestment.

Within the last year contracts have been closed on the afternoon of one day, and on the next morning the steam shovels would be excavating for the basement of the new building; on the second day correct excavation plans would be furnished the contractor, and on the fourth day the foundation plans would be in readiness. While the work is being gotten out by the contractor, according to the information he then has available, the architect completes the plans and these, together with the necessary specifications and details, are completed in approximately ten days' time. During this period also certain sub-contracts are placed by the architect for materials which take a considerable length of time for delivery, and the quantity of which can then be estimated and described. Also preliminary plans

are furnished the general contractor from which he can take off his quantities of brickwork, concrete work, steel, etc., which would not be apt to vary to any great extent from those quantities as shown on the final drawings.

While the excavation of the work is in progress the layout of the "job plant" is made and installed. This detail is given very careful attention, especially on concrete work, and is designed to handle the receiving, storing and distributing of materials for various portions of the work with the greatest facility and economy. All work is done with the idea of attaining the most practical speed coupled with the highest degree of efficiency. Progress charts are made out at the beginning of the work, and during the course of construction they are watched very carefully.

The general contractor and most of the subcontractors are selected and the contracts are awarded to them on a percentage basis with a fixed maximum cost, which, if exceeded, will be at the contractors' expense unless that excess is covered by extras which are approved by the architect and the owner.

One of the best examples of progress and cooperation on the part of all contractors employed on the work is shown in the record of the latest of the three units of a storage warehouse built for the Quartermaster Department of the United States Army in the new Central Manufacturing District. This "Unit C," typical of its two predecessors, is a six-story and basement building constructed of reinforced concrete with brick walls, terra cotta trim and steel sash, and otherwise complete as would naturally be required in a building of this type. Work was begun on this building April 10, 1919 and the entire structure was completed on December 31 of the same year. During this time all progress ceased from July 17 to September 21, due to the builders' strike in Chicago. This unit contains approximately 630,000 square feet of floor space and was erected, complete, at a cost of $1,700,000, or $2.70 per square foot.

It has been found unnecessary to estimate the cost of these buildings by the cubic contents, as their story heights do not vary to any great extent. The square foot floor area basis is employed by the trustees of the District for estimating their rental values of buildings to be leased. This same system is used by the architect for estimating the cost of these buildings, which cost is based on the gross area. The average reinforced concrete warehouse is heated to a temperature of 50° in the warehouse portions and 70° in the office portions; it is sprinklered, has a moderate equipment of plumbing fixtures, electric lighting equivalent to 1/5 of a watt per square foot, one freight elevator to every 30,000 square feet and trackage for one freight car to every 20,000 square feet. At present prices this kind of building would cost approximately $4 per square foot. This, of course, is due to the present high costs of labor and material, the pre-war price of this same type of building being $1.25 per square foot.



Chicago Junction Warehouse Building

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Steel Construction

PART II. COLUMNS AND BEAMS

By CHARLES L. SHEDD, C.E.

COLUMNS are uprights designed to resist compression. In Fig. 5 are shown several types of column. A is a single angle, to be used only for light loads and for short lengths. A column is designed to carry a certain load when the unsupported length of the column is known. By unsupported length is meant the distance below the beam which brings the load to the column to the next level, where it is properly braced sideways to resist buckling. When a column fails from being over-stressed, it bends in much the same way as a beam. When a column section is not symmetrical, it bends about its weaker axis.

The engineer refers to the stiffness of a column by the size of a property known as its radius of gyration. The reason that this is used is on account of its relation to the beam action when the column buckles or bends. He uses as a symbol for the radius of gyration a small r or the Greek letter rho. This is the measure of the stiffness of a particular column section. The measure of the stiffness of a particular column is the ratio of the unsupported length to the radius of gyration. This is spoken of as the l over r, or l/r. These two factors are in inches and it is good practice in design not to allow the l/r to exceed 120. For small loads, where the column serves a minor purpose, this is sometimes allowed to reach 150 or 160. When the l/r is small the allowable stress per square inch is large, and when the l/r is large the allowable stress per square inch is small.

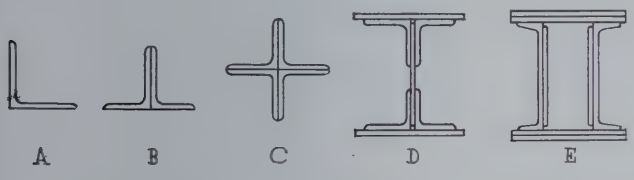


Fig. 5

A great number of tests have been made to determine a formula to give the amount of stress allowable per square inch for different values of l/r. Unfortunately, these tests have not given uniform results, and this has caused various engineers and compilers of building laws to adopt various formulæ and considerable confusion has resulted. The formula which is most widely accepted is undoubtedly 16,000—70 l/r. If this were universally accepted it would be much better for everyone. This formula has been adopted by the American Railway Engineering Association, the City of Chicago and the City of New York. It is common practice to place a maximum for this stress below 16,000, usually about 14,000.* In this discussion, any figures given will be based on this formula, with a limit for the l/r of 120.

In the single-angle struts as shown, Fig. 5A, an angle with equal legs is generally used. A 3x3 angle should not be used when the unsupported length, l, is greater than 6 feet. The maximum load for such a column, when the thickness of the angle was ⅜ inch, would be 15,000 pounds when the l was 6 feet. A table can be made up showing these limits:

3″ x 3″ x 5/16″L	5′ 11″	13,000#
3″ x 3″ x ⅜″L	5′ 10″	15,000
3″ x 3″ x 7/16″	5′ 10″	18,000
3½″ x 3½″ x 5/16″L	6′ 11″	16,000
⅜″L	6′ 11″	19,000
7/16″L	6′ 10″	21,000
4″ x 4″ x 5/16″L	7′ 11″	18,000
⅜″	7′ 11″	21,000
7/16″	7′ 10″	24,000
½″	7′ 10″	28,000
5″ x 5″ x ⅜″L	9′ 11″	27,000
7/16″	9′ 10″	31,000
½″	9′ 10″	35,000
9/16″	9′ 10″	39,000
6″ x 6″ x ⅜″L	11′ 11″	33,000
7/16″	11′ 11″	38,000
½″	11′ 10″	43,000
9/16″	11′ 10″	48,000
⅝″	11′ 10″	53,000

In Fig. 5B the column is made up of two angles, back to back. When the legs are not equal, the long legs are placed together to make the two radii of gyration as near equal as possible, and thus effect economy. To make them more nearly equal, the angles are frequently separated a little by washers through which the rivets pass, fastening the two angles together. The angles should be riveted securely together so that neither can buckle between the rivets alone, and so that the buckling

*A. R. E. 13,500#; Chicago 14,000#; New York 16,000#.

tendency of the column as a whole cannot overstress the rivets. It is common practice to space these rivets from 1 foot to 1½ feet apart. A small table will be made up for this type of column, similar to that for the single-angle type. These tables are not intended to provide data sufficient to design columns, but merely to give the architect a reasonable idea how much space will be required by the engineer for his material. These two types of small columns are frequently spoken of as struts, to distinguish them from more important columns.

Section L^s ⅜″ back to back		Length to make 1/r = 120	Allowable load when 1/r = 120
1—3″ x 2½″	x 5/16″ L^s	9′ 5″	24,000#
	⅜″	9′ 4″	28,000
1—3″ x 3″	x 5/16″ L^s	9′ 2″	28,000
	⅜″	9′ 1″	32,000
	7/16″	9′ 1″	37,000
1—4″ x 3″	x 5/16″ L^s	12′ 9″	31,000
	⅜″	12′ 8″	36,000
	7/16″	12′ 6″	42,000
	½″	12′ 6″	47,000
1—5″ x 3″	x 5/16″ L^s	12′ 2″	37,000
	⅜″	12′ 3″	45,000
	7/16″	12′ 4″	52,000
	½″	12′ 6″	54,000
	9/16″	12′ 7″	62,000
1—5″ x 3½″	x 5/16″ L^s	14′ 6″	38,000
	⅜″	14′ 7″	46,000
	7/16″	14′ 8″	54,000
	½″	14′ 10″	61,000
	9/16″	15′ 0″	68,000
	⅝″	15′ 1″	74,000
	11/16″	15′ 2″	82,000
	¾″	15′ 3″	89,000
1—6″ x 4″	x ⅜″ L^s	16′ 2″	55,000
	7/16″	16′ 3″	64,000
	½″	16′ 6″	73,000
	9/16″	16′ 7″	81,000
	⅝″	16′ 8″	88,000
	11/16″	16′ 9″	98,000
	¾″	17′ 0″	105,000

Fig. 5C illustrates what is commonly called the "star column," composed of four angles, back to back or separated by a small distance similar to those in Fig. 5B. This is a very uneconomical type of column but is often used in theaters under balconies as it requires but little fireproofing and therefore occupies less space and can readily be finished round. This illustrates what makes a column economical. With a given area it is evident that the greater the radius of gyration the greater the allowable load. To get this condition ideal it is therefore necessary that the material shall be as far away from the center of the section as possible and uniformly distributed. A circular hollow column, such as is commonly made from cast iron, obviously fulfills this condition in an ideal way. In the steel sections shown in Fig. 5, that for type E comes as near to filling this condition as is possible.

Type D is perhaps the most common type of column in use at present. It is called the "plate and angle" column, and is made up out of the web plate in the middle with four angles and two or more cover plates. Of course the cover plates may be omitted entirely. In the April number of THE FORUM mention was made of the Bethlehem H column which is similar to this, and a comparison was made between the two. When unequal legs are used in the angles, the short legs are placed against the webs for economy, but these must not be too short to provide for good riveting, especially when beam connections must be made to the column on the hollow side. A 3-inch leg against the web is a minimum, and then only with thin angles, and a 3½-inch leg is better, especially if a beam connection must be made on it. Care must also be taken not to put too many cover plates on the flanges as rivets must not be too long to drive well. It is best to limit the grip of the rivet to 3 inches when the usual ¾-inch rivet is used, not forgetting to include the connection angles for the beam connections. By grip is meant the total thickness of the metal through which the rivet passes.

With 8-inch webs and 10-inch cover plates the unsupported length may reach 21 feet at which point the maximum allowable load would be about 435,000#. By using 12-inch cover plates the length may be increased to 23′8″ and the load to about 475,000#. With a 10-inch web and 12-inch cover plates the length may reach 26′4″, and the load about 500,000#. With 12-inch webs and 14-inch cover plates the length may reach 32 feet and the load 640,000#. With web plates and covers both 14 inches, a length of 36 feet may be reached and about 660,000# as a load. When the length is only 24% of the lengths given here, the load may be increased about 84% and intermediate conditions approximated from these two extremes by interpolation.

Fig. 5E shows the "plate and channel" column. This type was much more common 15 years ago than it is now. For long lengths, and where the stress is not limited to 14,000# per square inch, it is considerably more economical than the plate and angle column. The inside plates on the backs of the channels are not used except for very heavy loading, after the cover plates and channels have been made as heavy as practicable. With 8-inch channels and 12-inch cover plates, a length of 36 feet may be reached. With 10-inch channels and 14-inch covers, 43 feet; with 12-inch channels and 16-inch plates, 48 feet; and with 15-inch channels and 18-inch covers, 55 feet. For still heavier columns a plate and two angles may be substituted for a channel, or an I beam may be placed between the channels, or a plate and four angles may be substituted for the I beam. These designs might be multiplied indefinitely, but those mentioned are typical. In designing peculiar sections, these two things must be borne in mind: to have it possible to drive the rivets required, and to drive good rivets without unusual or unnecessary expense.

In connecting beams to columns two methods are frequently used. One is to have the connection

angles on the web of the beam, and to rivet them in the field to the column with no more than a small angle under the beam already riveted to the column for erection purposes. The other is to have a seat with necessary stiffeners already riveted to the column with a small top angle. (See Fig. 6.) The advantage of the latter plan is to bring the field riveting down to a minimum. This means speed without sacrifice of anything serious in the design. It means slightly longer rivets through the stiffener angles, which are the small upright angles under the seat. It is not good design to have too many rivets in a row in these stiffener angles, as the top rivets are sure to get the greater part of the load. Two or more such angles may be used when the load requires it. If the stiffener angle projects far enough to interfere with the architecture, a plate may be used but it is not as satisfactory as the bearing of it against the seat angle cannot be made as certain as if a stiffener angle be used. When there is an eccentric loading to be resisted by the beam connection, the horizontal and vertical legs of both top and bottom angles may be made 6 inches to allow more rivets to be used.

When a beam frames into a column off center it is said to be eccentric, and it has a tendency to cause a bending in the column unless there is something to resist it, such as another beam which can pull in the opposite direction and which is strong enough to do so sufficiently, and the connection of

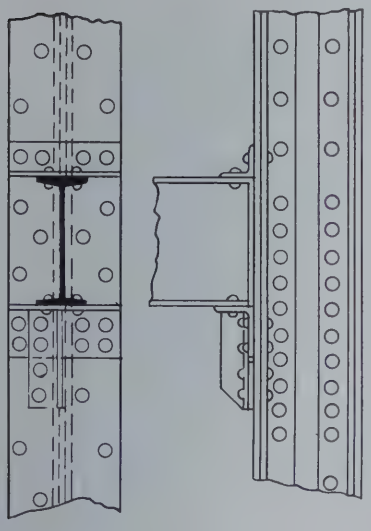


Fig. 6

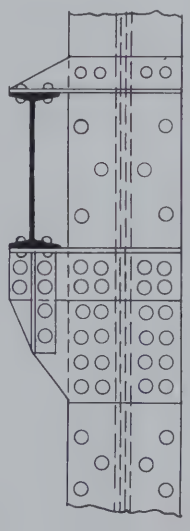


Fig. 7

which to the column is sufficiently strong to resist the strain safely. When a beam frames into a column eccentrically it needs special brackets to transfer the load to the column without overstressing the rivets. These rivets, in addition to transferring the direct load, are resisting a twisting known technically as a moment. Fig. 7 shows a typical connection for such a beam when it frames into the plate side of the column. When it frames in on the hollow side and is eccentric, it might have a connection similar to that shown in Fig. 8. If this beam had been nearer to the column so as to almost touch it, it might rest on a seat similar to that shown in Fig. 6.

Columns in office buildings are commonly made in two-story lengths, that is from 25 to 30 feet long, and sometimes a little longer. In buildings with large story heights, such as churches, each case has to be treated separately and some columns have to be shipped with very long lengths. These two-story lengths rest on top of one another and are

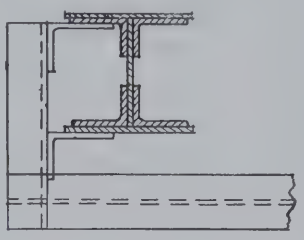


Fig. 8

spliced together. They should be designed so that the metal of the column above will rest entirely on metal below, or very nearly so. This bearing area should not in any case be stressed up to over 16,000# per square inch. The columns decrease in size in the upper stories of a building, and in some cases it is feasible to have an extra cover plate on the lower story of a two-story column. The splice is usually effected in a plate and angle column by adding short plates just outside the cover plates of the column below and have them extend up beside the column above. Filler plates are usually necessary between these plates and the column above. The plates lap over each length about 1′6″ making them about 3′0″ long, and are attached in the shop to the column below. The rivets to the column above are driven in the field.

When it is difficult to provide bearing properly between one length of column and that below, a small difference may be taken up by a horizontal plate called a "cap plate" being placed between the two lengths. This is also attached to the column below, it being done by two small angles like seat angles on the hollow side of the column. In some buildings it will be found that there is an odd number of stories so that one length of column must be short and of one story only. It is usually best to have this short length at the top, as the first story of a building is usually the larger, and the basement considerably smaller. This makes it possible for the lower length of column, which is the heaviest in the building, to have very little waste material in either the basement or first story. The bases for columns will be taken up in a future article.

In Fig. 9 are shown some ways of framing a cantilever in steel. This condition frequently occurs beside a stair well. In a wooden building an X shaped frame is frequently used. This would be bad in steel, due to the connections from one beam

to another being at or near an angle of 45°. Under these conditions it is difficult or impossible to drive the rivets properly, and it causes trouble in the shop and during erection. It is therefore common practice to frame the cantilever into the beam, supporting it in the manner shown in Fig. 9. A beam on the opposite side of the supporting beam from the cantilever extends back to a support and anchors it down. If the beams are the same size, the first method is used. The plate on top takes tension and the lower plate takes compression. To prevent this plate from buckling, it must be riveted

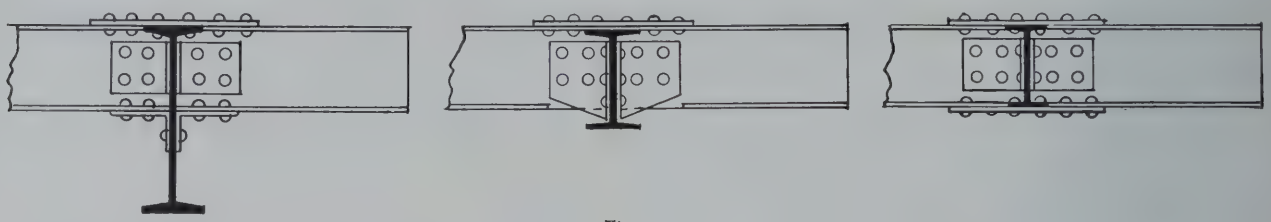


Fig. 9

to the lower flange of the supporting beam. As this is the tension flange of the supporting beam, it of course weakens it and due allowance must be made for these holes. If the supporting beam is suffic ently deep the third method may be used, the compression in the lower flange of the cantilever passing through the seat angles to the beam on the other side.

As the cantilever beam will not bear against the web of the supporting beam accurately, and usually not at all, this compression must pass through the flange rivets nto the horizontal leg of the seat angle, and similarly through the seat angle and rivets on the other side to the anchor beam. Therefore enough rivets must be provided to transfer this stress. If the supporting beam is not sufficiently deep to give room for the seat angle the second method must be used, necessitating the cutting off of the flanges of the cantilever and anchor beam to allow deep angles to be provided to transfer the compression. Here, of course, the cantilever and anchor beams are weakened in bending where they are most strained, and allowance must be made therefor.

It is best that beams frame into each other as nearly at right angles as possible. If the bevel is not more than 3 inches to the foot, it makes practically no difference. Up to 45° it can be done only with more or less awkwardness, and beyond that it is very unsatisfactory. The smaller beams carrying the floor directly, frame into larger beams known as the girder beams. It is sometimes, for architectural reasons, more practical to use two shallow beams than one deep beam. This effects a greater head room but sacrifices economy in the steel. When a beam frames into a double girder similar to this, the flanges of girder beams are usually so close together that rivets cannot be driven with a head on the web between the two beams. It is then necessary either to use bolts passing through both beams, or seat angles, or one-sided connections. The author objects to the latter type wherever it is possible to avoid it.

In outside beams, carrying walls, it is usually best to have them placed flush on bottom with the interior beams. This simplifies the column connection. Loose lintels may be placed below them over the windows and doors. Exterior columns are best placed with the webs parallel to the wall. This is because the beams are usually eccentric and the connections to the columns can be made better. (Compare Figs. 7 and 8.) This of course is not the strongest to resist eccentric loading, but it is preferred by the author as an interior beam usually frames into the outside beams at or near the column. These exterior wall-carrying beams are known as spandrels.

Beams do not necessarily frame into larger beams, as the size depends on span and distribution of loading. It is common practice to frame a beam into one the next size smaller, and a 10-inch beam or smaller may frame into one as small as 7 inches. The 7-inch beam does not conveniently frame into a 6-inch beam, however. It is often good design not to frame a beam of less than 8 inches into a column when seat angles are used. This is because a smaller beam cannot take a ¾-inch rivet in its flange, resulting in two sizes of rivets on the job and causing some confusion. An 8-inch beam also makes a better brace for a column than one smaller.

It is often possible to frame the web of a beam into a double-angle strut by passing it between the angles after cutting off the flanges. Others prefer to pass a plate between the angles and rivet it to the web of the beam. On the opposite side of a double-angle strut a shelf angle may be used. If the web of the beam is parallel to the outstanding legs of a double-angle strut, it is usually best to run a plate by the strut riveting it to the outstanding legs and to the web of the beam. At least two rivets should be used in a connection, or it would be possible for it to rotate about the single rivet.

Terra Cotta Roofing Tile

PART III

By ALFRED LO CASCIO

WE have come to a period when irregular laying of tile roofing, to help give texture to a roof as a whole, is being given particular consideration. Texture is largely secured through the use of hand treatment, applied by some manufacturers to the surfaces of the tile by thumb pressing, hand combing or some other such process involving hand work which, added to the excellent color schemes possible, gives tone and character that are most pleasing. With all this, however, it is essential for the tile maker to understand what is required, without attempting too much, which might easily result in mechanical irregularity and be a failure.

It is surprising to note the difference between the appearance of a roof covered with tile laid in the customary manner and that of another roof of exactly the same design and covered with the same tiles laid irregularly, and by irregularly is not meant carried to an extreme. The mission tiles, and even the Spanish and shingle patterns, can be laid with varied exposures to the weather, and use may be made not only of tile of the same size, for if a greater variation be required, manufacturers can produce tile of different sizes, which, mingled judiciously, will give the desired effect.

The purpose of all this is to secure a natural tile roof such as those seen in the old world countries, laid hundreds of years ago, crudely rustic and weathered in the course of time, before manufacturers or modern processes entered into the industry. Of course it would not be possible or practical, in view of climatic conditions in this country, to make or use tile hand made in its entirety. Tiles made wholly by hand are, therefore, a thing of the past insofar as modern manufacture is concerned, but it is quite possible to secure all the picturesqueness of the old roofs by using tiles of present-day manufacture, which means that all the desirable results which might follow the use of old tile may be had without any sacrifice of the practical qualities which are expected of a modern roof; all that is required is that the roofing tiles be laid in a manner somewhat different from the way in which tiles are usually applied.

There are small huts or ancient structures in certain European countries, and in the mountains of Porto Rico, where tiles can be found that were



Details of Tile Roofs on Two Houses in California

That at the right has eaves closures, while the other shows cemented hips

made by the Spanish monks hundreds of years ago, still in very good condition, so that once in a great while such tiles are secured and used, by purchasing an entire structure and bringing the tiles to America. These imported tile, however, are of such a nature that it has been found impossible, with severe changes of weather, such as are usual in some latitudes, to depend greatly upon them, and they are used chiefly on small areas such as mansards, projections here and there, wall coverings, belfries, or over arches for garden work—just touches to give a picturesque setting. These handmade tile are varied in colors, such as buff, pink, tan, green, gray, brown and black, and they must be embedded in cement as they are without nail holes. The tiles themselves are so varied that some are warped, while others have the edges turned, and the curves of others are so flat that several tiles are required, one over the other, in order to give the proper effect.



Example of Tile Treatment for Small Surface
George Washington Smith, Architect

The protection of this sort of a roof for the inside of the building is entirely another factor; the under roofing must be thoroughly waterproofed and made tight before the tile are laid, which is a costly item, so that a roof of these tiles should not be attempted if low cost is to be considered. There are a very few instances where tiles have been imported and placed on the roofs of summer houses or small buildings of other kinds to add to the attractiveness of certain large estates on our Atlantic coast, but while they are enchanting to view and beautiful in color tone, these roof surfaces have to be covered during the winter with heavy canvas, and even with this care the surfaces are in some instances beginning to discolor and scale, simply because the tile are not made for this climate and, in time, nothing will be left but the plain, drab under roofing, which will have to be recovered with some other material. If the owner, or architect, wishes to secure a similar effect, without continued importation of tiles unsuited for this climate, by co-operation with the manufacturer as to the requirements, he can get a roof that will rival the interest of the old world examples and, what is equally important, constitute a covering that will outlast the rest of the building.

The tiles of present-day manufacture are produced to withstand climatic conditions and in textures, shapes, sizes and colors to give an artistic and practical roof covering which can be laid with



House at Santa Barbara, California, with Roof in Character of Early Spanish Missions
George Washington Smith, Architect



Venetian Palazzo Showing Roof in Scale and Texture of Early Italian Work

such irregularity as to give the effect of the original handmade tiles, put in place centuries ago. To gain this result we must also eliminate stock ridges, hips and terminals, and in their places use the half-round, straight barrel, or tapered mission tile for all hips and ridges and their connections, mitering or laying them in crude fashion with Portland cement. There are sections on such roofs where it is absolutely necessary to use elastic cement instead of Portland cement, as the roof must be leak-proof, and if Portland cement is used against the hip board, under the hip roll, in the course of time with the least vibration of the building, the cement which has hardened will crack and fall out, while elastic cement will expand and contract with the building. To use a touch of Portland cement here and there, along the eaves courses, for example, in place of manufactured eaves closures, adds to the quaintness of the effect. Examples of old world methods of tile roofing, seen more often throughout California, are chiefly the result of an irregular method of applying the tiles to the roof; there are a few roofs in other parts of the country laid similarly, but there should be more and more of them.

Some tile have a natural rustic texture on account of the particular kinds of clays used, which adds wonderfully to the results obtained with the irregular laying, but in placing such a roof, consideration must be given to trying climatic conditions. If the tile is of vitreous quality and the texture and color are the result of natural burning in the kiln, or even if the color constitutes a slip covering on the surface, and the body on which the color is dipped or sprayed be hard burned, it is a safeguard against serious damage caused by climatic changes. In many parts of America we have snatches of summer and winter weather within 24 hours, and it is necessary that no misgiving be felt about the wearing qualities of a roof. There are, of course, sections of the country where tile need not be of this quality, as, if they are of good, hard clay they will withstand more severe weather than is experienced even in New England, for example.

These irregular methods of applying roofing tiles to give a desired effect are as foreign to the inexperienced tile roofer as building a staircase. One might suppose that the irregular laying would be better accomplished by an inexperienced roofer, who has not been schooled and drilled into mechanical perfection, but this has been disproved by past experience. To gain a natural, artistic roof requires the services of an experienced tile roofer because as he works, or rather as he plays, he still keeps in mind the element of risk in regard to weather tightness and remembers that leaks must not mar the integrity of the roof laid in natural beauty of irregularity with hard, mechanical lines forgotten.

It is, therefore, plainly to be seen that such roofs as we so often hear talked of can be secured right in this country and can be constructed in much the usual manner, with the protection assured by the use of practical workmanship, and it only means, as explained in articles previously written on this subject, the full co-operation of all who are interested. Particular pride should be felt that these tiles can be obtained without attempting to import them, and that one can have, with tiles of American manufacture, both the protection of a practical and water-tight roof when it storms, and the satisfaction of possessing an artistic, fascinating roof covering when the sun shines.

EDITORIAL COMMENT

WHAT CAN ARCHITECTS DO TO STIMULATE BUILDING?

CURRENT building reports, encouraging as they are, represent only work for which permits have been secured. The figures for work actually under construction would undoubtedly show a considerable shrinkage. This is apparent in talking with a number of architects; there is an undeniable interest in building, but there are still many obstacles in the way that prevent owners from signing contracts. The margin between what might be termed the "asking price" and the level on which contracts can be signed, is not particularly great—ranging from 10 to 20 per cent. This fact prompts the question, "What can architects do to stimulate building?"

That architects are able to stimulate building is proved by a number of offices, known to us, that are as busy right now as at any time in their careers. They are offices in which well organized business departments are working, which enable them to follow the trend of construction costs and to present evidence to owners that they have been able to eliminate practically all costs which are not represented by honest labor and fair material prices. When the cost of a building is cut down to these basic factors, with extravagant overhead, different kinds of "insurance," and wasteful organization on the work eliminated, the result is likely to be a figure on which an owner can proceed.

One architect, in talking recently with a member of our staff, made the statement that of the work that came to his office this year, none had failed to go ahead. He has no mystic power over his clients; he has no peculiar business secrets, but he follows the simple, businesslike practice of investigating contracting and material fields sufficiently to find where the excess cost lies, and then eliminates it. To be more specific, he prepares his plans in the usual way, basing them on current data obtained by his office with reference to costs. Surveys of materials are prepared and the plans submitted for bids to contractors, but instead of confining the asking for bids to some half-dozen or more contractors, 30 or more are asked to bid. Before asking for figures, assurance is had that the contractor actually *wants* work, and that he has a reliable organization that can execute the work efficiently.

The contractors are asked to submit their bids in detail, giving sub-contract figures, principal material quotations, and their profits. The architect reserves the right to, and does, secure independent sub-contract and material quotations. In this list of 30 or more sets of contract figures there is, of course, a wide range, but at the bottom of the list there are always from four to six figures within very small amounts of one another. These represent the bids of contractors who make real efforts to buy materials and operate economically.

The results of the architect's own investigation of material prices and sub-contract quotations are checked against the general bids. If the architect has been able to secure lower quotations, they are substituted for the figures of the contractor finally decided upon. The contract is made with the contractor's known profit as a fee, and with the total estimated cost of the building as the guaranteed contract price, the work being carried on in practically all respects as under a lump-sum contract. Additional provisions are made, however, that any savings in the cost of materials, under the prices on which the contract is based, revert to the owner, and any savings as a result of increased efficiency are divided equally between owner and contractor.

This method of arriving at a contract price undoubtedly places an extra burden on the architect; it is effective, however, in eliminating excess cost, and in accomplishing that the architect has made a contribution to the welfare of the building industry that will prove a lasting asset. With the evidence of the architect's economy properly laid before the client, it is comparatively easy for him to see that he is getting as much value for his expenditure as is possible under prevailing conditions. The provision giving him the benefit of any reductions in material costs removes objections to any possible penalty for going ahead, and the wheels of industry are started, which is most essential.

Plans similar to this are in use in other offices, sometimes with the elimination of the general contractor,—the purchasing of materials and the assembling of sub-contracts being done by a construction division of the architects' organizations, or as in Chicago, by an independent supervisory agent, working with the architect and known as a "construction manager." It is usual, under either method, to make a charge of four per cent to the owner which is paid to the construction manager or to the architect, according to the actual method of handling the detailed work involved. There are advantages, however, in the service of the general contractor which cannot immediately be given by the architect, and on the whole some such method as outlined will prove most satisfactory.

Numbers of other suggestions might be offered to show that progressive architects are extremely important factors in he revival of building. The few given will suffice, however, to point the way and it is safe to say that architects who use their resources thus will profit in gaining reputations for accomplishment under difficult conditions.



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Southern Pine Association, New Orleans, La., "How to Plan, Finance and Build Your Home" (11 x 16 ins.). 156 pp.

An orderly account of the procedure followed, from choosing a house design to furnishing it in good taste, enters into the contents of this book, the main object being to show the hundred and two specially designed homes of modest requirements. Plans and sketches prepared by the Architects' Small House Service Bureau of Minnesota, an outgrowth of an activity suggested at the American Institute of Architects Convention of 1919, are nicely presented with adequate description from which working plans and accompanying documents may be ordered. The house designs are of such scope that most extreme desires are satisfactorily met in styles, materials or accommodations. The text on mechanical equipment and special features is made into concise chapters in an authoritative way, as are the sections on Selecting the Site, Financing, Planning the Kitchen, Painting and Finish, Planting the Grounds, etc. The classification of three, four, five and six room houses is one of the features of this intimate book on building the home—the whole publication being a very commendable work.

General Chemical Company, 25 Broad Street, New York, N. Y., "Making Poor Concrete Floors Good" (8½ x 11 ins.). 12 pp.

This is an explanation in text and illustration of the application of the concrete hardener "Hard-n-tyte." Something about the elements which enter into combination with concrete to present satisfactory wearing surfaces are dealt with and followed by details of treating floors. A practical testing machine to emulate the traffic that slabs are subjected to under constant use is devised by this company's engineers and their findings given. Results of simple cube tests and effects of paint over "Hard-n-tyte" are shown from photos. The directions for specifying and using this hardener are so brief as to be contained in a single page.

ANNOUNCEMENT OF SUMMER COURSES

THE Department of Architecture at the Massachusetts Institute of Technology is glad to state that the following courses will be given this summer at the Rogers Building in Boston; namely, Shades and Shadows, Perspective, Office Practice, Elementary and Intermediate Design, Elementary and Advanced Constructive Design, and Structural Design. Any of these courses if satisfactorily passed may be substituted for corresponding winter work.

Detailed information concerning these courses can be procured by application to Professor William Emerson, 491 Boylston St., Boston, Mass.

ANNOUNCEMENTS

Messrs. Duhring & Ziegler, architects, formerly in the Bailey Building, Philadelphia, Pa., have removed their offices to the new building recently remodeled by them at 1309 Locust Street.

Mr. B. H. Bacon and Mr. O. A. Tislow announce the formation of a partnership for the practice of architecture and engineering with offices at 31 West Ohio Street, Indianapolis, Ind. Manufacturers' catalogs and samples requested.

Mr. George Bain Cummings, formerly of the firm of Lacey, Schenck & Cummings, announces the opening of offices for the practice of architecture at 602-4 Security Mutual Bldg., Binghamton, N. Y.

Mr. Ross Love Henderson announces the opening of an office for the practice of architecture at 740-2 David Whitney Bldg., Detroit, Mich.

Messrs. Horace H. Lane, H. D. Davenport and A. A. Peterson announce the formation of the firm, Lane, Davenport & Peterson, for the practice of architecture and engineering with offices in the Dime Bank Bldg., Detroit, Mich. Manufacturers' catalogs and samples requested.

Messrs. Boring & Tilton, architects, and Ernest Greene, associate, announce the removal of their offices from 52 Vanderbilt Avenue to their new building, 141 East Forty-fifth Street, New York City.

Mr. Robert C. Walker, architect and engineer, Washington, D. C., announces the establishment of a branch office at Salisbury, Md., in the Salisbury Building Loan and Banking Association Bldg. Manufacturers' catalogs and samples requested.

Mr. William H. McKay announces the opening of an office and studio at 179 West Rock Avenue, New Haven, Conn., for the practice of architecture. Manufacturers' catalogs and samples requested.

Mr. John Russell Pope, architect, announces the removal of his office to 17 West 46th Street, New York, N. Y.

Mr. Robert L. Harris, architect, announces the removal of his offices from the Calvert Bldg., to 13 W. Saratoga Street, Baltimore, Md. Manufacturers' catalogs and samples requested.

Mr. Charles S. Schneider, 2258 Euclid Avenue, Cleveland, Ohio, announces the association with him in the practice of architecture of Mr. S. Clyde Merrell and Mr. Robert W. Dickerson.

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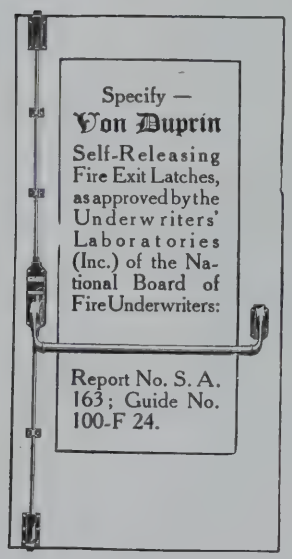
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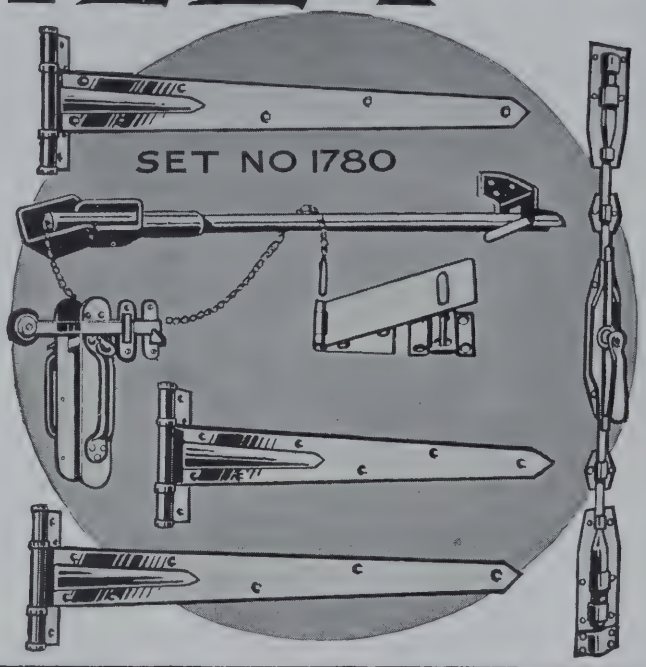
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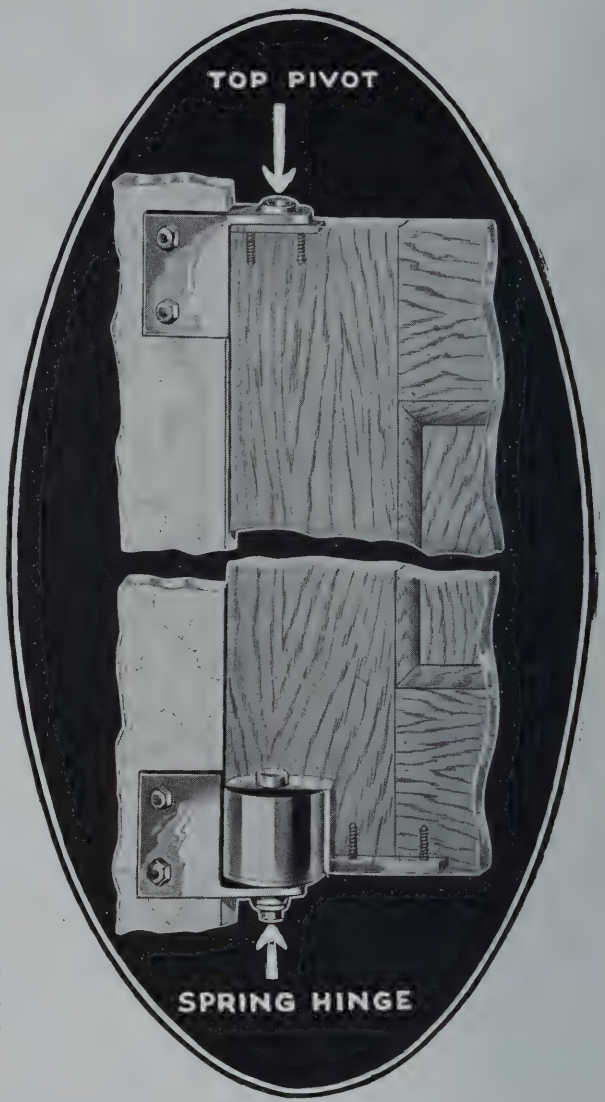
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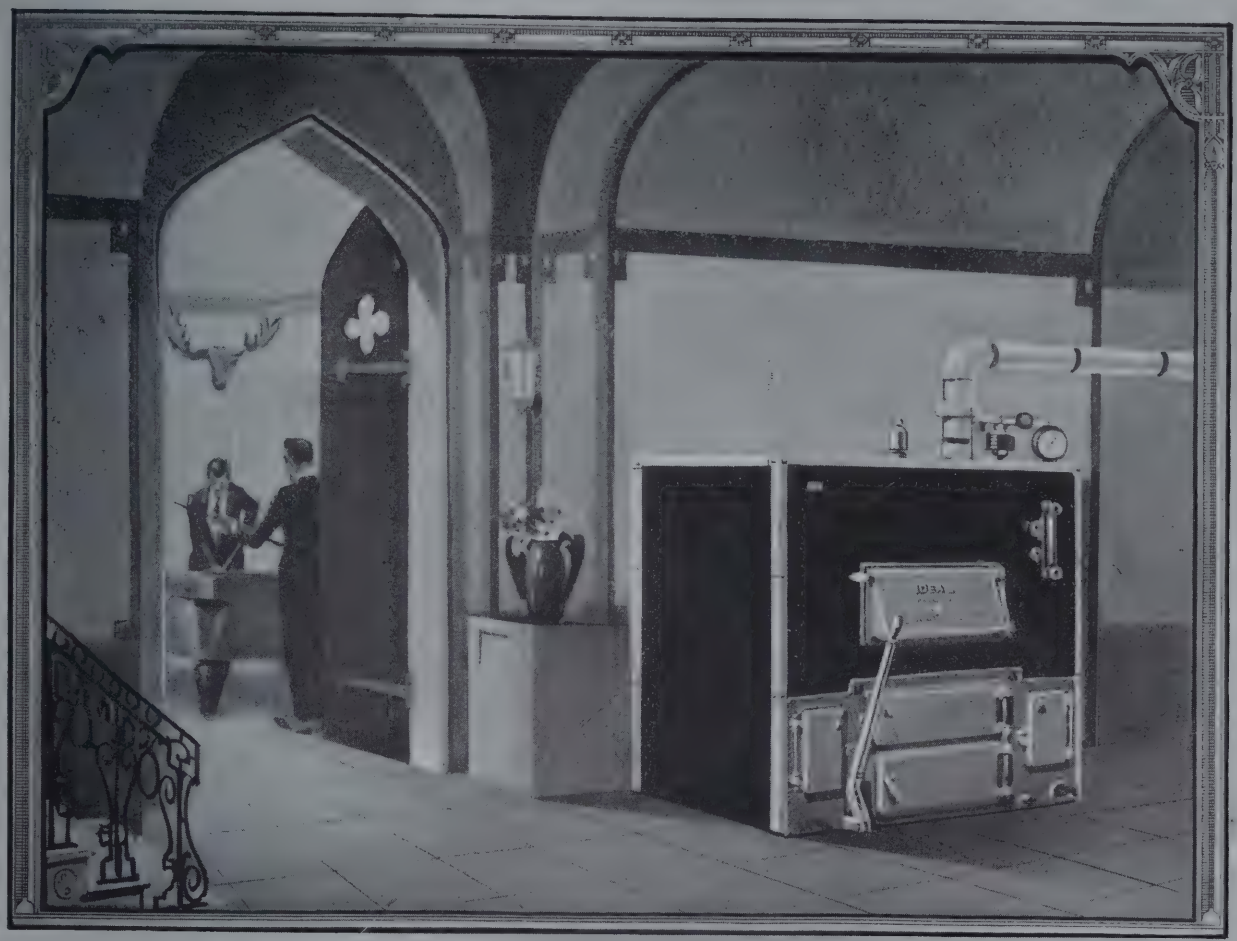
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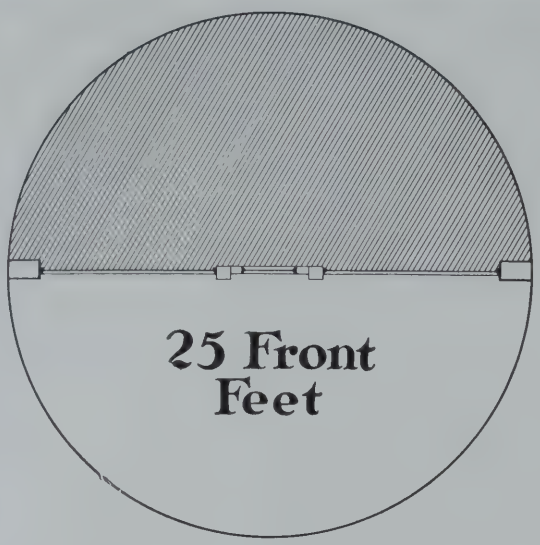
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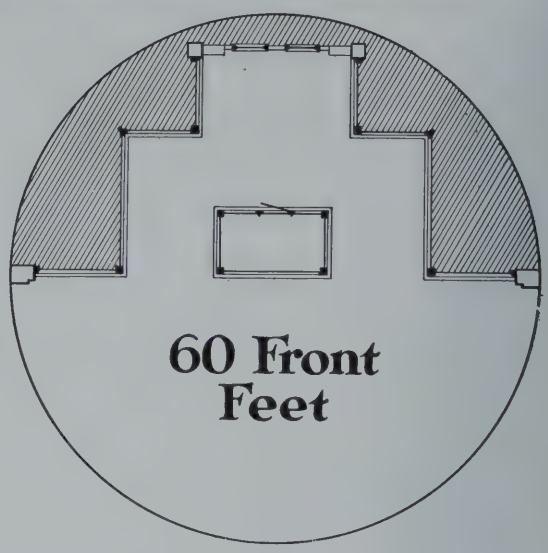
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Redwood's rot resisting and high insulating powers make it ideal for factory roofs

WHEN the atmosphere inside a plant is hot and humid from rising steam, there are two things to guard against—the quick rotting of the roof boards and timbers, and the condensation of moisture which, through dripping, may injure goods in process of manufacture. This is particularly important in the weaving and dyeing shops of textile factories, in paper mills and wherever the atmosphere is heavily charged with moisture.

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"I am well aware of the excellent rot-resisting qualities of California Redwood, also of its high insulating power. I believe there is an excellent field for Redwood for roofs, especially in paper mills, weave mills and other finishing mills. * * * The heat-insulating power of the light Redwood is fully as great in value in roofs of buildings containing much moisture as its fungus-resisting power."

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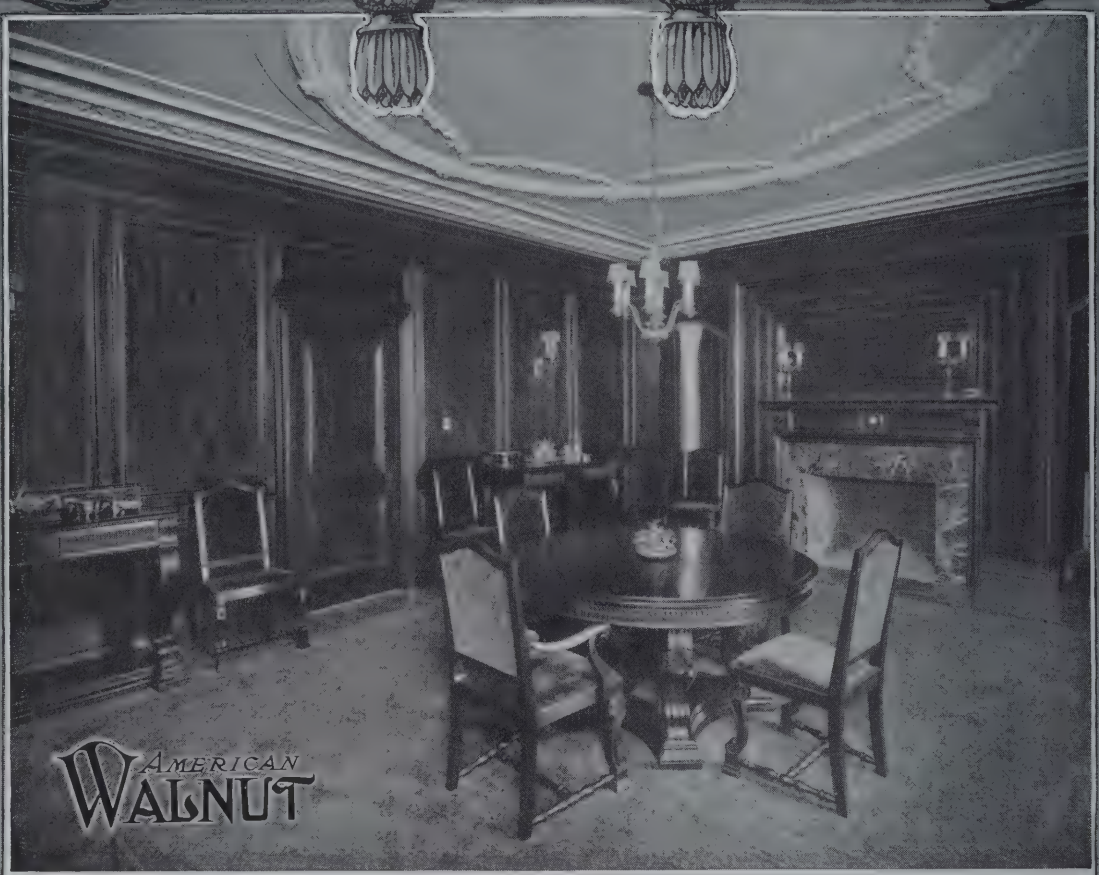
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THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 6

CONTENTS for JUNE 1921

PLATE ILLUSTRATIONS

	Architect	Plate
SERVICE AND SALES BUILDING, CADILLAC MOTOR CO., DETROIT, MICH.	*Albert Kahn*	79
SALES BUILDING, FORD MOTOR COMPANY, NEW YORK, N. Y.	*Albert Kahn*	80, 81
HOTEL SOMERSET, CHICAGO, ILL.	*S. N. Crowen*	82–84
GIRLS' SCHOOL AND LOWER SCHOOL, MILTON ACADEMY, MILTON, MASS.	*George F. Shepard*	85–87
HOUSE OF ALLAN SHELDON, ESQ., DETROIT, MICH.	*Stratton & Snyder*	88
HOUSING DEVELOPMENTS AT CROMPTON, R. I., AND NEWMARKET, N. H.	*The Housing Company*	89, 90
PONDFIELD COURT APARTMENTS, BRONXVILLE, N. Y.	*Harry Leslie Walker*	91
HOUSE AT NEW ROCHELLE, N. Y.	*C. A. Patterson*	92
RESTORATION OF OLD TAVERN AT DANBURY, CONN.		93
LIVING ROOM MANTEL, HOUSE OF JAMES A. BURDEN, ESQ., SYOSSET, L. I., N. Y.	*Delano & Aldrich*	94

LETTERPRESS

	Author	Page
A MEXICAN BELL TOWER Drawn by O. R. Eggers	*Cover Design*	
THE EDITOR'S FORUM		45
FIRST CHURCH OF CHRIST, LANCASTER, MASS.	*Frontispiece*	
THE BULFINCH CHURCH, LANCASTER, MASS.	*Rev. Charles A. Place*	191
ARCHITECTURE AND THE AUTOMOBILE INDUSTRY Albert Kahn, Architect	*Wirt C. Rowland*	199
DEPARTMENT OF ENGINEERING Steel Construction, Part III, *Charles L. Shedd, C.E.* A New Brick Wall		207
MINOR ARCHITECTURE DEPARTMENT Some Post-War Housing Developments in New England	*Tyler Stewart Rogers*	213
DECORATION AND FURNITURE DEPARTMENT Authentic Precedent in Colonial Interiors		219
BUSINESS AND FINANCE DEPARTMENT Developing the Constructive Force of the Profession An Organization Which Renders a Complete Building Service Practical Results under Fixed-Fee Building Contracts		223
A GROUP OF STORES AT SOUTHERN PINES, N. C. Aymar Embury II, Architect		227
EDITORIAL COMMENT		228

ALBERT J. MacDONALD, Editor

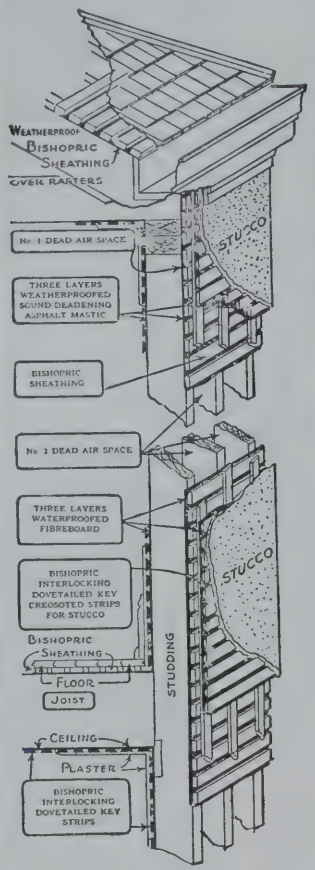
Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.
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ARCHITECTS
401 CARTER BUILDING, CHURCH STREET
ROCHESTER, N. Y.

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The Bishopric Manufacturing Co.,
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A. B. HEADLEY



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THE EDITOR'S FORUM

CREATING PUBLIC SENTIMENT

A PUBLIC expression of the thing most needed to revive industrial and business activity, made by Francis H. Sisson, Vice-President of the Guaranty Trust Company of New York, can be applied with particular benefit to the building industry which has been perhaps the greatest sufferer from recent economic conditions.

In an address before the American Institute of Banking, at Minneapolis, on June 16, he said:

"For more than a year the American people have been discounting the future. The time has arrived when they should begin to 'cash' the present. There is ample evidence to indicate that many of the readjustments which we have undergone in the last twelve months have practically been completed, and although there will inevitably be further readjustments in other directions, we are rapidly succeeding in laying a foundation for the revival of business on a sane, sound and stable basis."

Speaking further on the obstacles that stand in the way of a business revival, he said:

"Notwithstanding that there is still considerable 'frozen' credit in this country, the principal economic problem is not the credit situation, although many, especially in agricultural districts, appear to think so. The chief obstacle is the difficulty of developing an adequate demand for goods. Superficial consideration of that problem would suggest that the solution would lie in the readjustment of prices, but lower prices in many lines have not aided materially in stimulating buying. As a matter of fact, in some instances, paradoxical though it may seem, the lower the price the less buying there has been. This curious situation has been due, of course, to the belief generally entertained that practically all commodity prices were certain to recede even more than they have, which has tended naturally to prolong the so-called buyers' strike.

"It would be well, however, for the public to study recent price trends and their underlying factors, for many significant developments are occurring. For instance, the wholesale prices of several basic commodities, such as wheat, corn, sugar, rubber, copper, lead, pig iron, petroleum and timber, increased 2½ per cent last month. That advance marked the end of a steady decline in the prices of these commodities from their peak on June 1, 1920, which represented a fall of more than 54 per cent."

Similar reactions are noted in the building field; while general prices have not shown a rise there is a noticeable stiffening in them. This result is indicated in the chart shown in the Service Section in this number of THE FORUM. Considering that building trades wages are practically stabilized for another year, a point must soon be reached which will be the basis on which farsighted investors will enter the field. This will be the necessary stimulus to push prices up a little, and at that time the general public will take a definite interest. This point is not far off, and architects will be wise to keep in close touch with price movements so they may prepare for the turn in the tide.

BOOK NOTES

ARCHITECTURAL DETAILS FROM WESTMINSTER ABBEY AND ST. MARGARET'S, WESTMINSTER. A collection of 150 plates in two portfolios. 12½ x 16 ins. Phototype illustrations. Text by Albert Edward Bullock. Published in London by J. Tiranti & Co. Price for two portfolios, £4, 4s.

WESTMINSTER ABBEY, from an architectural standpoint, does not arouse enthusiasm equal to that felt for many English cathedrals because of its general leaning to the French mode of Gothic and the excrescences that have gathered about it in the centuries it has existed as the British national monument. Much interest, however, attaches to its details, particularly the type of perpendicular Gothic and the vaulting which covers several periods, among which is the fan vaulting in the Chapel of Henry VII, undoubtedly the finest example in existence.

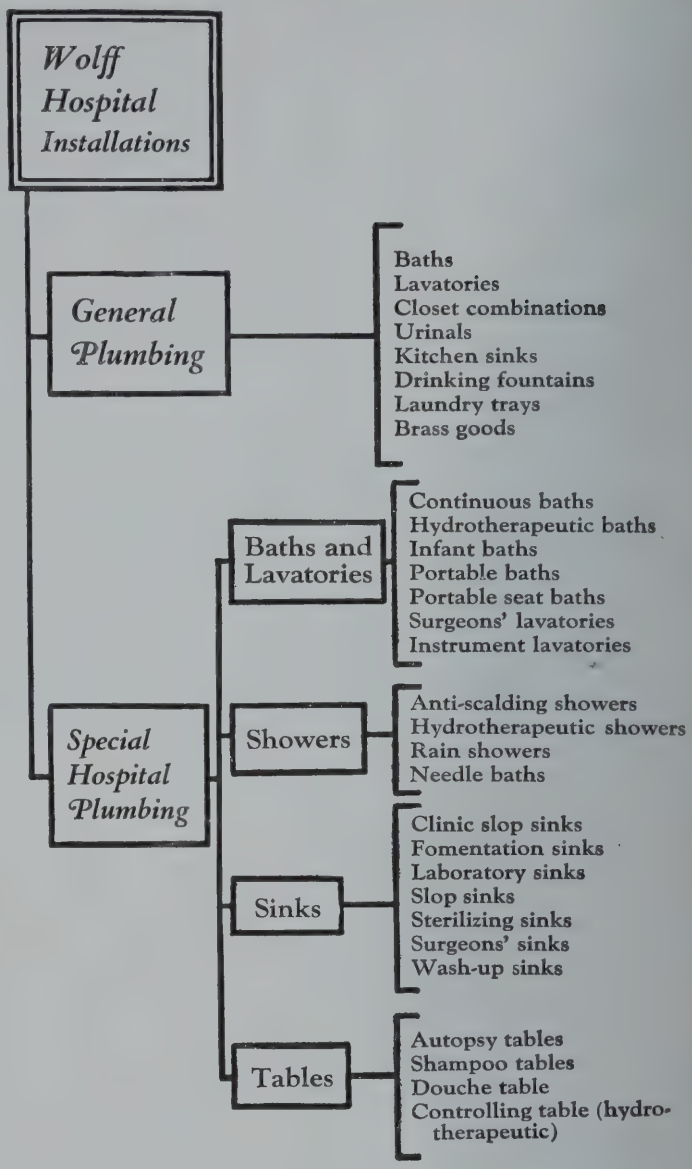
The larger interest in Westminster Abbey is, perhaps, in the monuments and memorials with which it abounds and which represent art from mediæval days to modern times. It is chiefly with these features that these portfolios deal, although there are sufficient illustrations of the fabric itself to give a comprehensive idea of the structure.

The first portfolio illustrates principally architectural sculpture, vaulting, choir stalls and other carved woodwork of the chapels. The second shows the pulpits, memorials, tombs and wall tablets which comprise a record of English art through many centuries. There is a particular interest in these details today because they indicate varying expressions of memorials that are valuable in guiding present-day efforts in monuments to commemorate individuals and deeds of the late war. All of the plates are reproduced from excellent photographs and by a process that makes possible the preserving of the details.

IN the April number of THE ARCHITECTURAL FORUM an article was published illustrating the algebraic method of solving stresses in wood trusses. The principle involved is exceedingly interesting and shows how one may check over trusses on the ground or for a preliminary sketch design when the principal dimensions are known. We regret to say there were some mathematical errors in these calculations, as graphic checking has demonstrated, but these errors do not affect the value of the algebraic solution of the truss problem.

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The ARCHITECTURAL FORUM

VOLUME XXXIV JUNE 1921 NUMBER 6

The Bulfinch Church, Lancaster, Mass.

By the REV. CHARLES A. PLACE, *the Minister*
Photographs by the Author

ONE of the charmed spots of beautiful Lancaster on the Nashua is the green. Four buildings face the green—the church, the library, the high school and the town house. No one who has stood in front of the town house on some day of sun and shadow, and looked across the green to the church on the north, will ever forget the beautiful setting. The story of the church, the oldest and finest of the four buildings, appealing alike to the architect and to the lover of the beautiful, is here set down briefly, and as fully illustrated as may be.

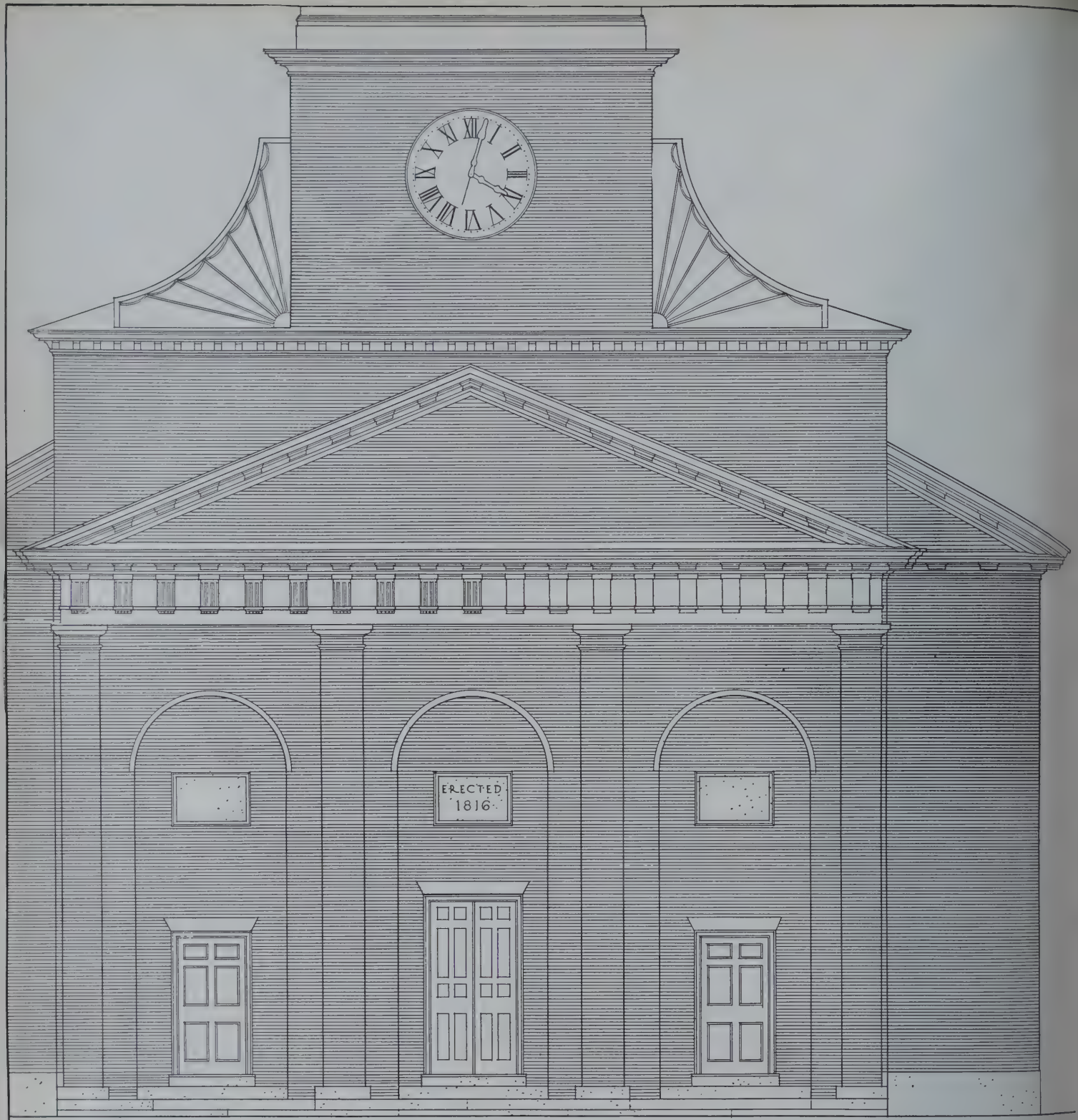


The Pulpit from Organ Gallery

The corner stone was laid July 9, 1816; the building was completed within the year, and dedicated Wednesday, January 1, 1817. The sermon was preached by the Rev. Nathaniel Thayer, D.D.,— the minister of Lancaster, whose descendants today constitute a very influential part of the town and congregation. The cost, approximately $20,000, was ordered by vote of the town and assessed on the pews. The edifice is of brick from plans of Charles Bulfinch of Boston, and is without doubt the finest proportioned of all his churches, though with an interior less elaborate and costly than the New South which formerly stood in "Church Green," Boston, — corner of Summer and Bedford streets. It was reared almost wholly by artisans of Lancaster,—a noble memorial to their skill and integrity,—of Lancaster brick in Flemish bond, Lancaster timber, and of the celebrated Bolton lime. In size it is 74 by 67½, with a porch or vestibule 49 feet in width, projecting 19 feet, and a portico 4 inches less on each side in width, and projecting 17 feet. It stands today almost exactly as built, and practically as sound. A Roman Doric cornice is well executed, having bored mutules. Measured drawings are shown of the portico, the cupola and of certain interior details.

The tower and cupola are deserving of long and careful study. Suggested in Holy Cross, 1803, and the New North, 1804, Boston, the result here is wonderfully fine. It will be noted from the picture that the angles between the tower and porch attic are decorated with fan-like ornaments. The cupola is surrounded by twelve Roman Ionic columns, supporting a well balanced entablature. An interesting feature, and suggesting old Roman construction, is seen in the lines of the dome. The total height from the ground, including the vane, is 118 feet. In the cupola hangs a Revere bell, which, recast on account of some defect, bears the date 1822. It would be difficult to alter any line of the cupola without impairing its balance. Comparison of its proportions with those of the choragic monument of Lysicrates, increases our appreciation of Bulfinch's lines.

The facade and tower treatment bear witness to the influence of Bulfinch's trip abroad. Directly or indirectly, he drew from the best examples of the past. The arcaded portico, with its touch of the classic art of Italy, has a charm beyond what a picture or description can suggest. The treatment of the three doors is simple, all having beaded frames





PLAN

SCALE
1/8" = 1'-0"

CHARLES
BULFINCH
ARCHITECT

ELEVATION
FIRST CHURCH OF CHRIST
LANCASTER MASSACHUSETTS

AFTER MEASURED
DRAWINGS BY
BIGELOW & WADSWORTH
ARCHITECTS



FIRST CHURCH OF CHRIST, AT LANCASTER, MASS.

BUILT FROM DESIGNS BY CHARLES BULFINCH IN 1816

and a 1½-inch round moulding in the angles of the frames and masonry.

The porch or vestibule has a distinctly New England spirit, with the dignity and plainness of a New England meeting house 50 years earlier. There are touches of beauty here, but they are few and not what the exterior leads us to expect. Two staircases bend in and meet halfway in a common landing, under which the congregation passes to the middle inner door; a broader staircase ascends to the upper floor, passing from thence to right or left to the galleries, or up a narrow flight of stairs to the belfry.



View in Porch on Church Front

On passing from the porch into the church we come upon beauty fully worthy of the best of the exterior. The interior which meets the eye, with the exception of the ceiling and wall ornamentation and certain changed details in the north end, is the same substantially as when finished in 1816. In 1881 the Thayer Memorial Chapel was built, connecting with the church, necessitating the cutting of two doors, the closing up of the arched window back of the pulpit and the removal of four pews on each side of the pulpit. Two windows each side of the pulpit, on the lines of the lower and upper rows of windows, eight in all, had been closed at some earlier date. In the gallery a few changes were made when the organ was installed. Otherwise the seating is as originally planned.

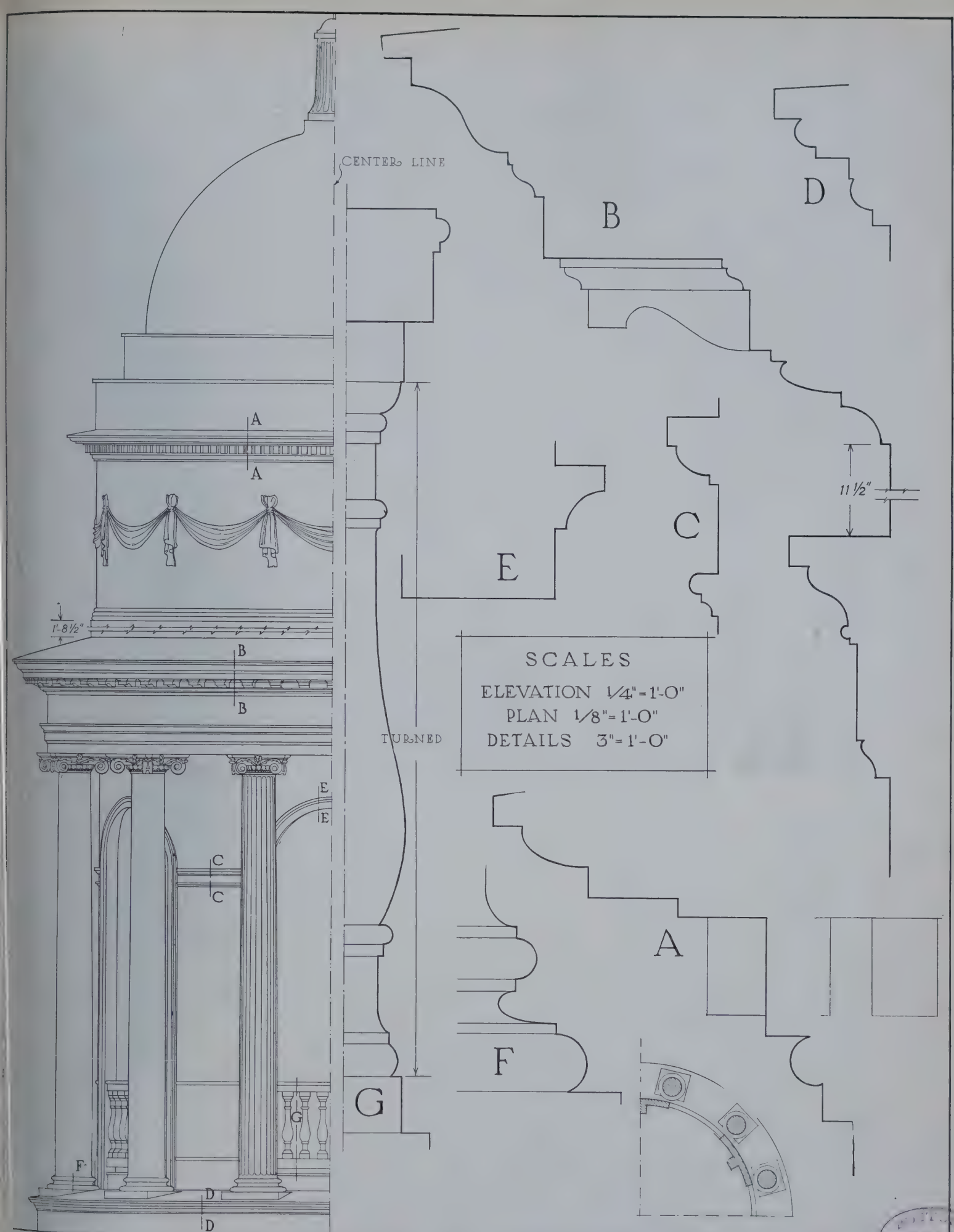
In 1869 a proposition was made to run a floor on the level of the gallery floors, thus converting the structure into a lower vestry and an upper church. This was in line with what actually happened in so many New England churches, but would have been little short of vandalism. The beautiful pulpit would have been lost, and low-



Wall Treatment and Doorway to Vestibule



Stairways to Gallery from Vestibule



CHARLES BULFINCH
ARCHITECT

UPPER PORTION OF TOWER FIRST CHURCH OF CHRIST

LANCASTER MASSACHUSETTS

AFTER MEASURED DRAWINGS BY BIGELOW & WADSWORTH ARCHITECTS

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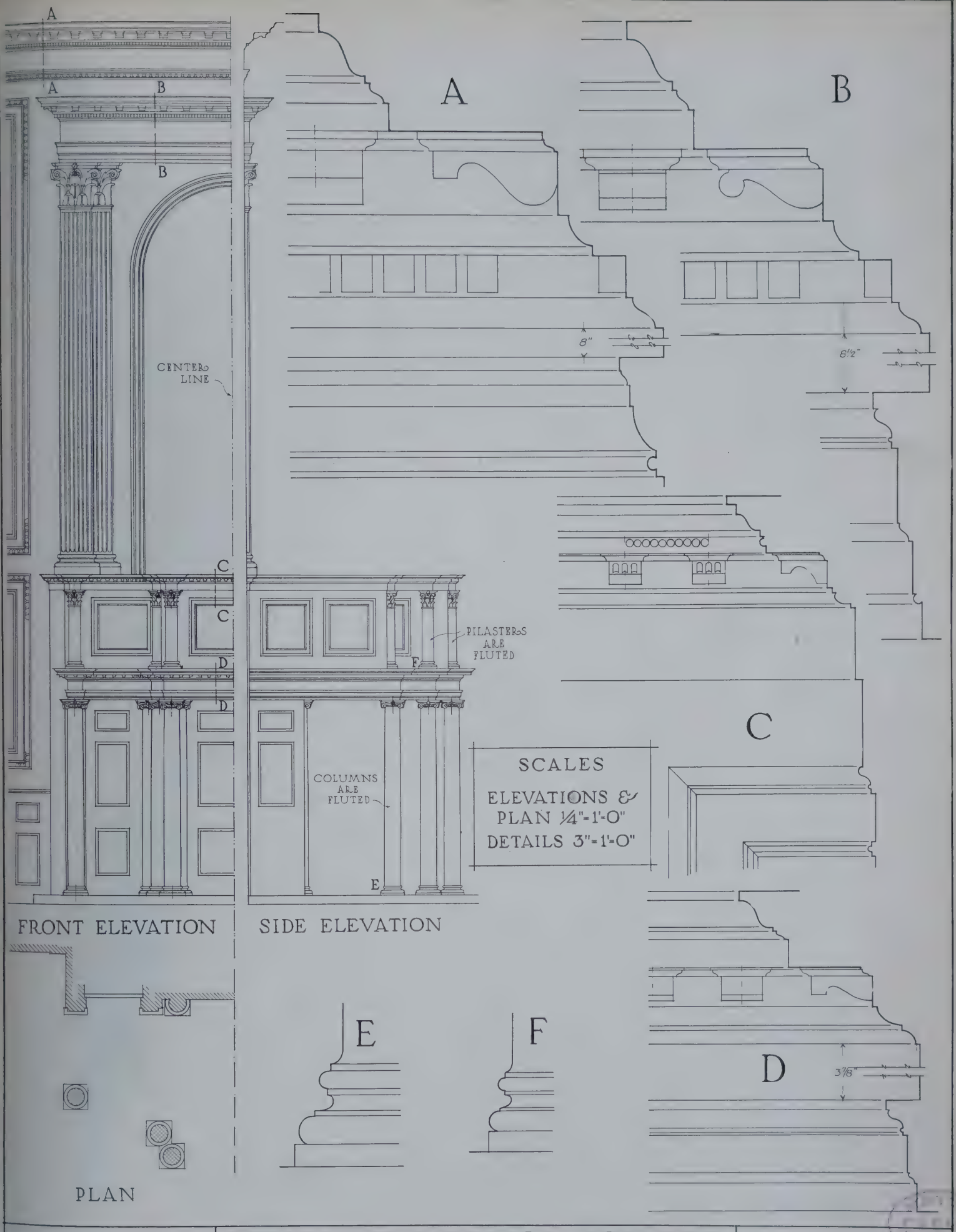
Detail of the Pulpit

studded utility rooms would have taken the place of the present beautiful interior. To the courageous and vigorous stand of the minister, Dr. George M. Bartol, the church is everlastingly indebted that the plan was abandoned. At that time the interior was redecorated.

There is no picture of the interior of the church prior to the changes made necessary by the erection of the chapel. What Bulfinch would have done with the wall and ceiling treatment, had he been given a free hand without the hampering necessity of economy, may be imagined from a study of the State House, Boston. Certainly the walls and ceiling in 1816 did not harmonize with the galleries, pulpit and other details, and decorating in 1900, while not Bulfinch's, are quite in keeping with the rest of the interior and what Bulfinch completed elsewhere. Some of the moulding designs used in 1900 are to be found in the State House, Boston, and in St. Stephen's Church, Wallbrook, London, which Bulfinch admired, and are quite in keeping with his good taste. An illustration of the ceiling is shown and another of one of the gallery doors, showing wall mouldings and detail of the cornice. The gallery is supported by fluted columns with Roman Doric capitals, with no bases, 10 feet 11 inches high and well proportioned. The gallery is enclosed with an open balustrade, so called, and curves in toward the south end. An illustration is shown looking toward this south end. At present there is no way of artificially lighting the church, and the old method of heating it with two stoves is still in use. The pews are made of pine, stained cherry color, and the numbers on the doors, at one time covered, have been restored. Side pews, 4 x 8, suggest the old style "box pews," while those in the middle of the church, 3 x 10, are usually called "slips." The windows have inside blinds. The two busts at the south end in one illustration are of Dr. Thayer (1793–1840), and of Dr. Bartol (1847–1906), and were executed by Bela Pratt.

Of the pulpit, much should be said, or very little. Two illustrations are here shown and also a measured drawing. The pulpit should be seen and carefully studied; then the judgment of architects well qualified to pass upon it would be confirmed, that no more beautiful pulpit of its type exists in America. Not only is the proportion of width to height well nigh perfect, but it possesses lightness and grace to a high degree. The only change in this design from the original is the removal of the arched window which was covered with "a rich green curtain of figured satin and velvet with a ball fringe roping and tossel." The present curtain is red damask. The pulpit stands on a platform 4 inches high, with Ionic columns 6 feet 5½ inches high. The total height from the platform is 10 feet 8 inches. It is painted white. The paneling and two mahogany doors enclose a 25-inch space which originally contained stairs,—the only way of entering the pulpit until the chapel was built in 1881.

This description would not be complete without some reference to the architect and the artisans who made this beautiful building possible. That



CHARLES BULFINCH
ARCHITECT

PULPIT AND INTERIOR CORNICE
FIRST CHURCH OF CHRIST
LANCASTER MASSACHUSETTS

AFTER MEASURED DRAWINGS BY
BIGELOW & WADSWORTH
ARCHITECTS



Recent Ceiling Enrichment in the Bulfinch Manner

Charles Bulfinch was the architect is beyond question, though his name does not appear on the town records. This church is listed by Bulfinch, and he is also credited with its design in a newspaper report at the time of dedication. Why he should have been chosen to design the church is not hard to determine. Almost every man who was chosen by the town to aid in procuring land, to consider plans, or to form the building committee, was or had been a member of the General Court, and so had ample opportunity to see the wonderful Bulfinch State House and its exquisite interior finish. The building committee consisted of Eli Stearns, at the General Court 1806–10, Jacob Fisher, 1811–13, and William Cleveland, 1813–15. Eli Stearns was a local carpenter and builder, and a first class workman, as more than one Lancaster residence, now standing, attests. Jacob Fisher was a cabinet maker and a progressive business man, and possessed of rare skill with tools. Doubtless his hand carved the pulpit. It is a splendid work in every detail. There is a story about "Jacob Fisher and the Twelve Apostles" based on the tradition that Jacob Fisher gave twelve columns for the church. These undoubtedly were the eight columns and the four pilasters under the pulpit, and would thus naturally connect his hand with the pulpit and its carving. William Cleveland, a man of taste and refinement, born in Salem 1777 and coming to Lancaster in the early part of the nineteenth century, must have seen something of the wonderful work of McIntire, who died 1811, and hence was an ardent inspirer in choosing the Bulfinch plan and carrying it to execution.

There is no record of Bulfinch's ever being in Lancaster. Someone, therefore, must have interpreted the simple plans which he drew. That someone, it would seem, was "Captain Thomas Hersey, master builder," according to the town records. Hersey, who was not a resident of Lancaster, received $500. That is all we know. Who he was or where he came from is not known. Was he connected with Bulfinch in other work,—the New South Church, Boston, erected 1814, the McLean Asylum buildings, opened in 1818, or the two buildings for the Andover Theological Seminary, 1817–18? These are questions yet to be answered, upon which no clue has been found.

Undoubtedly the plan of the church, its exterior lines,—the portico, the tower and the cupola; the interior arrangement,—the lines of the gallery and the design of the pulpit, were by Bulfinch. The execution of this plan was due to men who knew the principles of construction and the uses of tools, and who built with integrity and on honor. All high praise to those early artisans who wrought themselves into this enduring monument, as well as to him whose mind conceived its beauty.

While much of the best work of Bulfinch has fallen before the unceasing march of change which is common in American cities, enough remains to bear eloquent testimony to his rare taste and to his keen understanding of the value of proportions and the refinement of detail.



Church as Seen from the Pulpit

Architecture and the Automobile Industry

By WIRT C. ROWLAND

Of the Office of Albert Kahn, Architect

A TREMENDOUS impetus has been given to building, during the last 20 years, by the development of the automobile industry. Among those professionally interested in architecture to say this is not enough, for this industry, by reason of its special requirements, has given opportunity for the creation of a distinctly modern type of architectural design. Until recently this type has been characterized chiefly by a certain lack of grace, outline and color, and often a complete absence of pleasing proportion, obviously not the deliberate choice of the designers.

If a fanatical economy and a frenzy of practicability have produced such a result, so carefully, and often effectually, avoided in the designs of motor cars themselves, the opportunity affords a test of our ability as architects to cope with the difficulties of modern requirements, and,— by its faults, — it gives proof positive that we have not advanced abreast of the science of industry and invention, the problems of which we deal with.

The expansiveness and looseness which have characterized our architectural thinking, the yearning to be free from all restrictions, — these have been our inheritance from preceding generations of romantic thought and philosophy. The commercial and industrial problems have, by their difficulties, brought to us the compelling exercise of discipline. Therein lies the chief value of such a type of architecture, be the exercise never so distasteful and the result never so rigid and artistically unsatisfactory.

The beginning of the manufacture of motor cars in this country was almost simultaneous with the practical application of the concrete frame to building, a form of construction commended to the manufacturer and his architect by its economy and simplicity of erection. It is hard to say which has been the more dominant factor involved in these problems, — the arbitrary requirements of the manufacturer or the rigid form of concrete construction, — but in both we recognize the necessary agents of discipline, and we may be grateful to them for having turned us to real thinking.

A substantial element in planning these buildings has ever been a demand for unusual light. It is that in these problems which has brought into use the slender piers and the tremendous areas of glass, so difficult to be made to assume any semblance of architectural form. These, with the customary planning of the structural features in a system of bays, have limited the treatment to a more or less awkwardly connected sum of units, the chief opportunity being the careful adjustment of the proportion of piers and spandrels and as interesting a treatment of the surfaces of each as cost may permit.



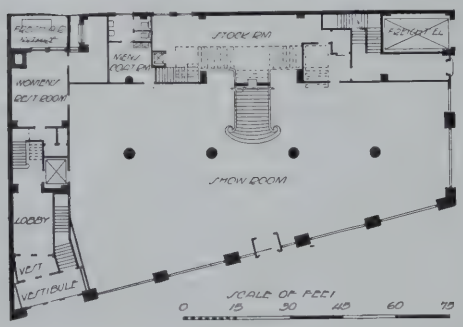
Two of the Four Wings, Durant Building for General Motors Co., Detroit

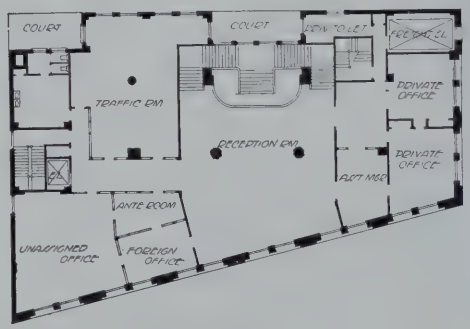


Detail of Ford Sales Building, New York

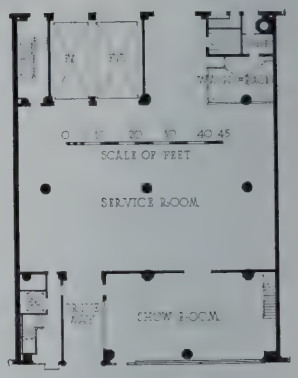


"Modern" Sales and Service Building, Detroit





First and Second Floor Plans of Ford Building, New York



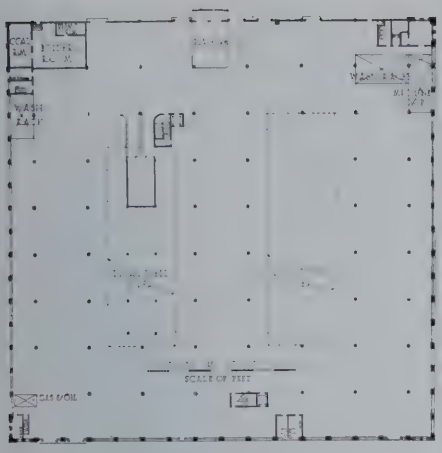
Main Floor Plan of "Modern" Garage

The so-called unit system has further prevented these buildings from assuming any sort of completeness, because they are generally arranged so they may be built upon and extended, story by story and bay by bay, without substantially altering the character; for indeed they do not seem to begin or to end definitely. It is this characteristic, more than any other, by which we may identify those buildings used for the manufacture and sale of automobiles. Today we find such difficulties only partially overcome where more pier space is allowed at the corner, or perhaps a whole pylon and a parapet which can be of more adequate proportions.

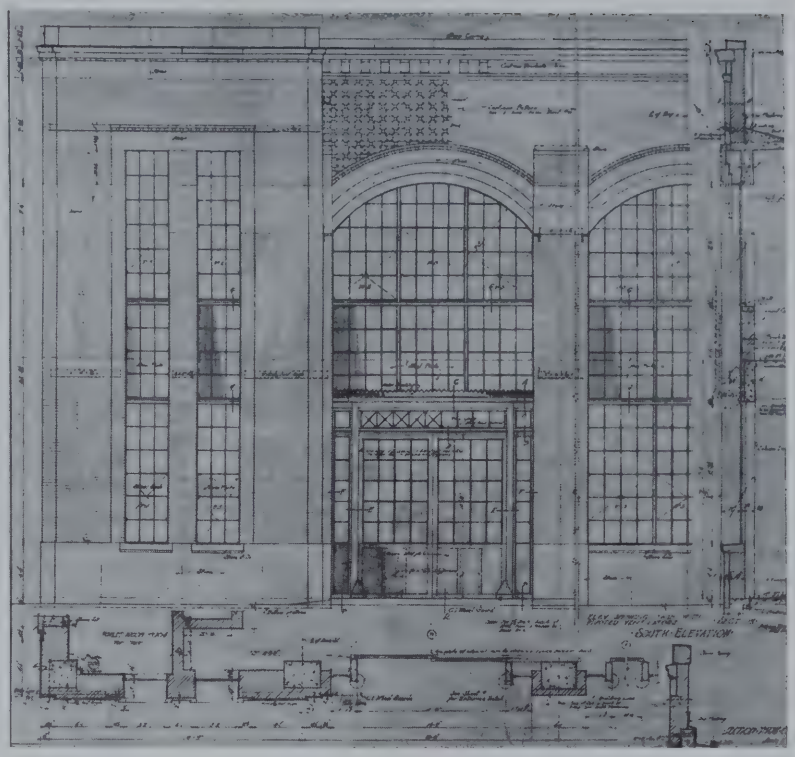
Nothing, however, has more happily contributed to the general organic effect than the opportunity of introducing smaller intermediate piers for mullions above the voids of the first story, particularly when the voids may be given an agreeable shape and proportion. Then we find ourselves, with the exception of opportunities presented by detail, at the end of any possible progression.

Economy has been a vigorous censor of elaboration in these buildings, and has restricted the kind of material and prescribed limits in detail. Those stern beginnings, with scarcely more than projecting bands to intrigue the interest, have taught us to rejoice at the present day in the use of the more plastic clay materials, brick and terra cotta, and the possibility of a scale of detail attainable by them. Brick was at first used in elaborate patterns because of the necessity of giving some interest to otherwise ugly proportions of pier and spandrel. It now fulfills its more useful function of giving its due color in the design, contrasted occasionally with simple bands of stone, or sparingly used in small surfaces of diaper patterns and projecting cornices and simple dentils. A solution for the crowning piece of detail, the cornice, has thereby been offered, suitable for the factory or service building of more modest architectural pretensions—a solution offering much variation of scale and elaboration.

Within the last few years there has come into demand, for the first time on the part of the motor industry, that which calls for a more architectural



Main Floor Plan



Detail of End Pylon and Bay, Packard Service Building

treatment—the service and sales building of an elaborate character. A clay material does not seem to have met the demand in either color or texture, hence we now obtain successful results with the light color and texture of stone facing, after a use of more than 20 years of concrete, a material which, however cleverly contrived, was never artistically acceptable to architects or owners.

The use of stone has effected much change in the designing of this industrial work and has imparted a character ever identified with a most dignified building material. It has made possible a general refinement, a freer contour, and an opportunity for modeling not found in other materials, and its necessary use in large courses of thin slabs has by no means reduced its interest but has given a certain distinction by providing a surface comparatively unbroken by joints and revealing, as never before, the beauty of its warm, gray surface. In this material, carved ornament of an appropriate character may add a human touch, a need often felt in buildings where the lines are otherwise rigid and geometrical.

From start to finish, from concrete to stone, and under pressure of requirements both practical and structural, the architect has felt the need of nothing so much as of a reasonable precedent for the entire range of industrial work—that is, to speak of the architect who is not literally obsessed by the idea of a new architectural style. Perhaps, on account of the apparent lack of this precedent, there has been more thinking, more going back to structural and organic elements, always a healthy exercise in any art, and particularly in architecture. As far as architecture is concerned, any attempt to revivify it otherwise miserably fails, and most signally so when any effort is made to change its outward forms without attention to its inner principles.



Packard Service and Garage Building, Chicago

We must invest our work with those prin-



DETAIL OF PACKARD SERVICE BUILDING, DETROIT



DETAIL OF FORD SALES AND SERVICE BUILDING, DETROIT

ALBERT KAHN, ARCHITECT

ciples, and if buildings for commerce and industry, particularly those in connection with automobile manufacture, have shown progress and thought, it has not been through any desire to create a new type, but through the application, from problem to problem, of those essentials which are incorporated in the great architecture of the past.

A reluctance to follow any but an outward form as a precedent in these industrial problems results in inevitable failure. History furnishes us, however, a rich store of precedent for analysis which must be broad as well as minute, and the opportunity to study scale, treatment of surface, profile and line is no greater than that of studying broad masses and groups of piers. For these we may look among the examples of Lombard Romanesque. Then, too, we cannot remain unaware of the many lessons to be learned from the Gothic—of the relation of tall openings to buttress piers. In these two styles there is much material for study, not to say inspiration, especially for that part of our industrial work to be built in brick or in brick and stone. The possibilities for giving actual charm and interest of detail are limited only by a sense of propriety.

With respect to historical precedent, our attention is again drawn to our opportunities to build in stone. With 20 years of experiment behind us, we have rubbed elbows with every difficulty under the sun, and what can and what cannot be done with practical requirements is pretty well known. We have felt the restrictions keenly and it is with real satisfaction, in spite of them, that we may turn to such a material capable of giving us line and beauty of detail, for the inspiration of which we find no style so replete as that of the classic in its range from Greek to Georgian.



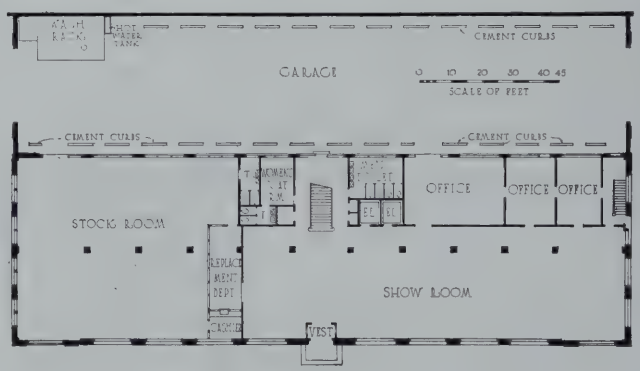
Principal Floor Plan of Building Below



Packard Service Building, Detroit



Ford Sales and Service Building, Highland Park, Detroit



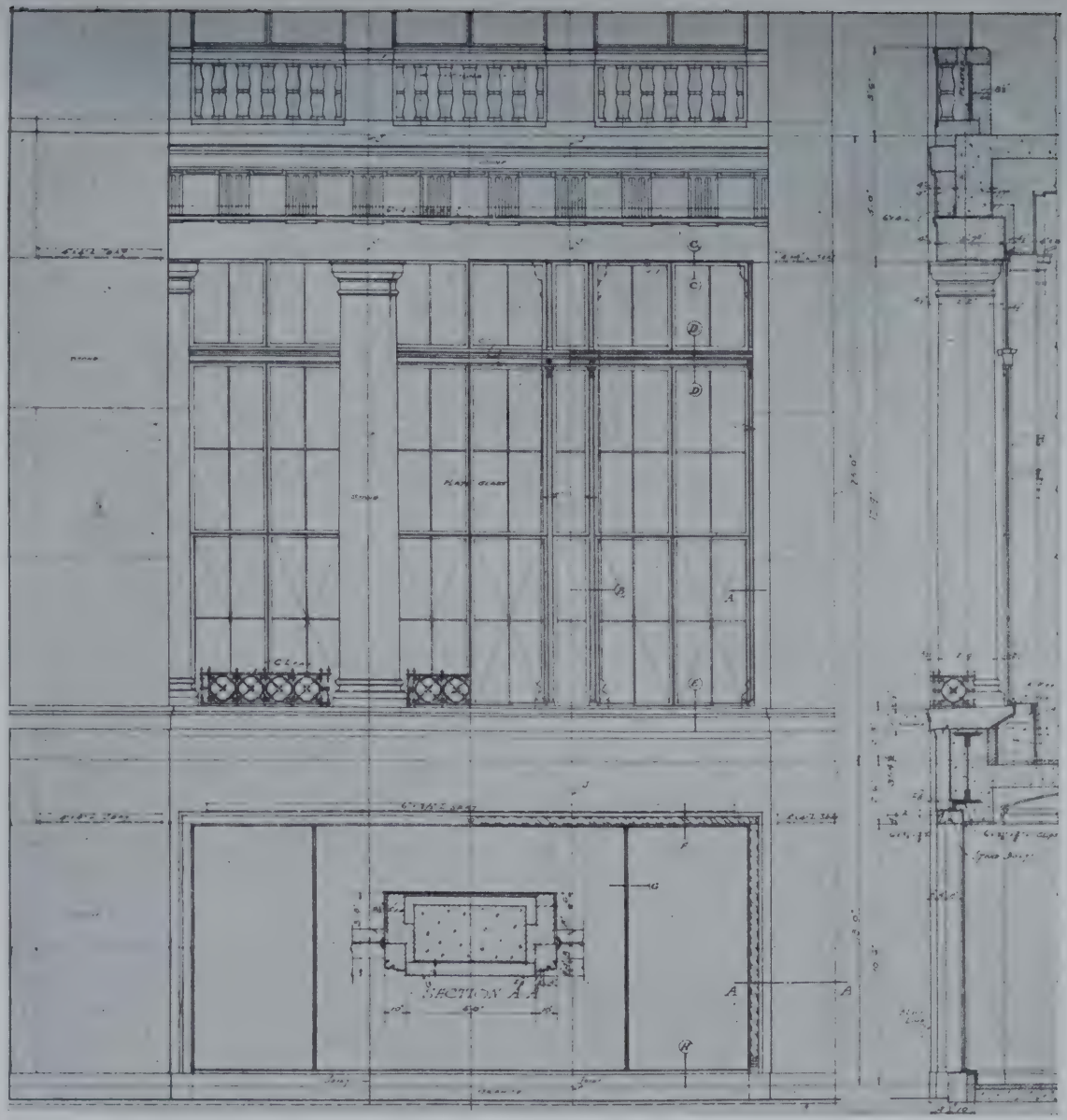
Main Floor Plan

It is true that, for some time previous to this industrial development era, certain modern masters used the classic style for structures almost similar to the automobile service building. Their success was only partial, because their sympathies were not with modern ideas and modern requirements, and their interest was not in the actual solution of commercial problems, however masterly their knowledge and use of classic forms. But we must bear in mind that a success equal to theirs, not to say a development beyond their achievement, must be attended by the same measure of devotion to study and the intimate understanding which they possessed.

By the use of stone, an opportunity—not an assurance of success—has been given us. Here is an opportunity of using the underlying principles of architecture with an actual knowledge of its forms, for a superficial, drafting-board code of the classic orders will not suffice, nor will any other ideal based on fine sketches only.

One becomes aware of a danger which accompanies the solution of the modern industrial problem. The cleverness which has been engendered by the effort to make our buildings of architectural interest with such limited means tends to overbalance those fundamentals which we have learned in dealing with organic members. Classic form is not susceptible to this cleverness; it is too impersonal and too universal, — that is why it finds such substantial and enduring favor. Its use in the problems which are distinctly modern is modified not only by practical and economic restrictions, but also by its own very principles. It is not the clever adaptation of its parts to a modern frame work, but an actual dismemberment and a building up again according to those principles, which will create and endure.

Deploring, as he may, this commercial age, the architect who would appreciate the possibilities of present-day problems must first strip his ideas of architecture down to the very skeleton. His view of history and tradition must exclude the unessential, and magnify only those vital periods when structure and beauty were developed at the same time and exerted an influence upon each other. Our modern industries permit somewhat the same opportunities for beginnings of architectural development, and for the exercise of just such skill, though such efforts in this department of human endeavor may



ELEVATION AND SECTION OF TYPICAL BAY AT LOWER FLOORS



CENTRAL BAY OF MAIN FACADE

SALES AND SERVICE BUILDING FOR THE CADILLAC MOTOR CAR CO., DETROIT. ALBERT KAHN, ARCHITECT



Main Facade of Sales and Service Building for Cadillac Motor Car Co., Detroit

not compare ethically with impulses or forces which produced Greek temples or Gothic cathedrals.

Not the least among commercial forces, the automobile industry has given commissions to erect building after building, hardly varying in demands of arrangement, thereby offering the opportunity to perfect by repetition and constant experiment. It has, by its commercial ideals, forced us to eliminate elaboration and to conform, in our architectural expression, to structure, thereby disciplining us in the sole use of essentials. It is not possible to predict great things from the motion of a force so unethical and so material, but many believe in the salutary effect of training which the solution of its problems must have upon men who may have opportunity of expressing a more lofty, human ideal.



First and Second Floor Plans



VIEW OF MAIN FACADE

SERVICE AND SALES BUILDING, CADILLAC MOTOR CO., DETROIT, MICH.

ALBERT KAHN, ARCHITECT

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GENERAL VIEW

SALES BUILDING, FORD MOTOR COMPANY, NEW YORK, N. Y.

ALBERT KAHN, ARCHITECT



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MAIN ENTRANCE

SALES BUILDING, FORD MOTOR COMPANY, NEW YORK, N. Y

ALBERT KAHN, ARCHITECT



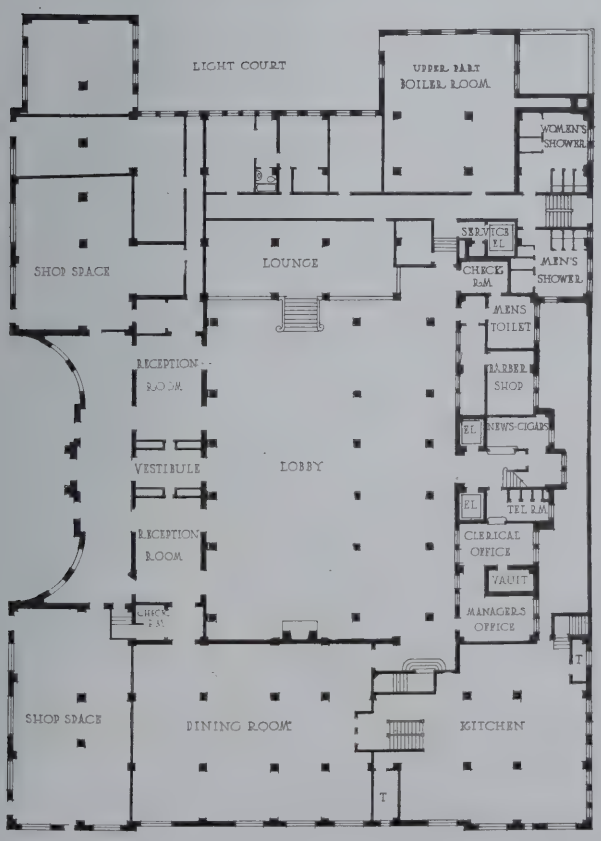
COURT VIEW

HOTEL SOMERSET, CHICAGO, ILL.

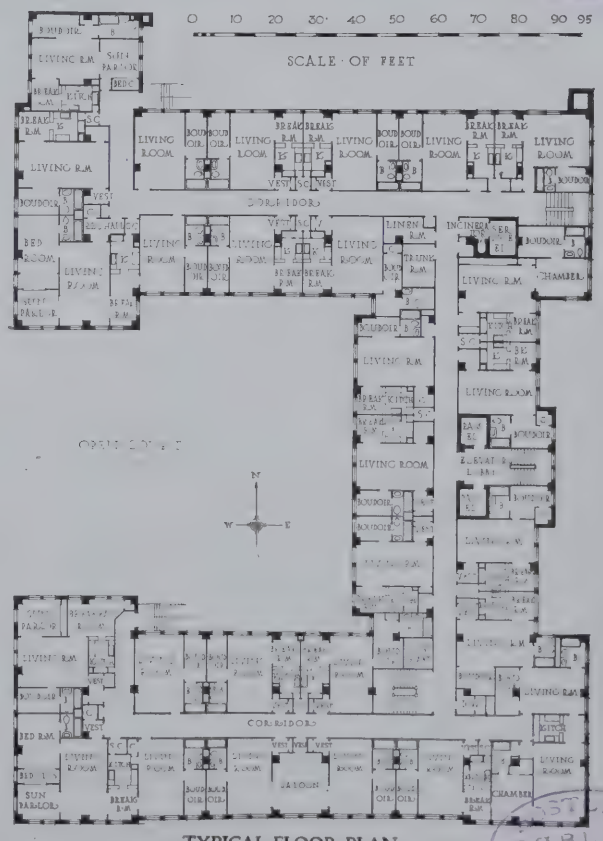
S. N. CROWEN, ARCHITECT



GENERAL VIEW



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN

HOTEL SOMERSET, CHICAGO, ILL.

S. N. CROWEN, ARCHITECT

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VIEWS OF DINING ROOM AND LOBBY

HOTEL SOMERSET, CHICAGO, ILL.

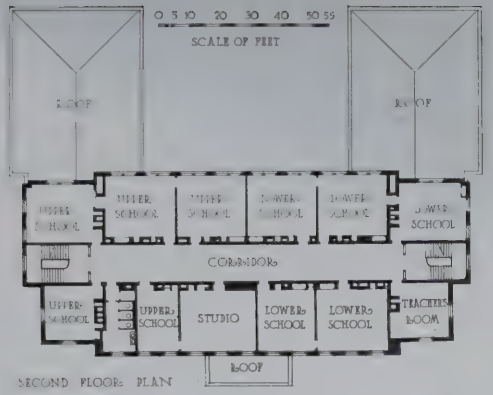
S. N. CROWEN, ARCHITECT



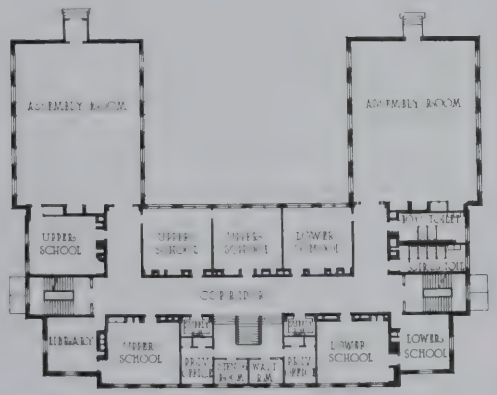
DETAIL OF END

GIRLS' SCHOOL AND LOWER SCHOOL, MILTON ACADEMY, MILTON, MASS.

GEORGE F. SHEPARD, ARCHITECT



SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND FLOOR PLAN



DETAIL OF MAIN FACADE

GIRLS' SCHOOL AND LOWER SCHOOL, MILTON ACADEMY, MILTON, MASS.

GEORGE F SHEPARD, ARCHITECT



GENERAL VIEW



REAR COURT, SHOWING THIRD FLOOR OPEN AIR ROOM

GIRLS' SCHOOL AND LOWER SCHOOL, MILTON ACADEMY, MILTON, MASS.

GEORGE F. SHEPARD, ARCHITECT



GENERAL VIEW



FIRST FLOOR PLAN



SECOND FLOOR PLAN



HOUSE OF ALLAN SHELDEN, ESQ., DETROIT, MICH.

STRATTON & SNYDER, ARCHITECTS

Steel Construction

PART III. PLATE GIRDERS AND COLUMN BASES

By CHARLES L. SHEDD, C.E.

STEEL plate girders are used when the loading is too great for single beams. Fig. 10 shows a typical plate girder. The angles and plates at the top and bottom are known as the top and bottom flanges, while the vertical plate between them is called the web. The vertical angles are known as stiffener angles. Under them, next to the web, are filler plates. Web splices are shown at *a* and *b*. If the plate girder is supported by a column it is best, unless the girder is small, to rest it on the top of the column with stiffener angles over the column section as shown in Fig. 10, even if the column continues up above the girder. A plate is carried down on the back of the end stiffener angles, along the column, to make the structure more rigid and to reduce the eccentricity in the column as much as possible.

When the girder deflects it necessarily puts more load on the inside than on the outside of the column, and more rivets are necessary in the stiffeners over the inside of the column than on the outside. The figure shows two stiffeners on the inside and one on the outside of the girder over the column. These stiffeners must bear firmly against the lower flange angles, and the column below must be planed so as to bear smoothly against its cap plate. Connection angles are provided under the cap plate, and stiffeners on the inside of the column if double stiffeners are used on the girder over the inside of the column. These stiffeners always have filler plates under them. If there is a column above they must also bear against the top flange angles firmly, and the column above must be planed to a smooth bearing. In planing the columns care must be taken that this planed surface is accurate and at right angles to the axis of the column, the same as when one column bears on the top of another.

The figure shows the girder carrying another column a short distance from the column below. Stiffener angles must be provided under this column with filler plates, and the stiffener angles must bear firmly against the top flange angles; the column above must be planed accurately, similarly to those at the end.

The stiffener angles at the end must have enough rivets to take the reaction of the plate girder. When there is no column of any size above that below, as is shown in Fig. 10, it is good practice to provide enough rivets in the stiffeners on the inside to take $\frac{2}{3}$ of the load and enough rivets in the outside stiffeners to take half of the load. The stiffeners under the column above should have enough rivets to take the load from this column into the web of the plate girder.

Directly across the web the plate girder is subjected in a vertical plane to shear only. At an angle of 45° it may be subjected to either tension or compression. In a horizontal plane it is subjected to shear. In Fig. 11 are shown two dotted strips, *a* and *b*, at 45°. The strip *a* would be subjected to tension and the strip *b* to compression. These conditions, of course, are continuous the whole length of the plate girder and in a symmetrical arrangement each side of the zero shear point which is, in a symmetrically loaded girder, at its center.

The reader can actually see this compression and tension in the web if he will construct a plate girder out of cardboard, and cut slots as indicated in Fig. 11 along the dotted lines. After he applies the load the strip *a* will be found to be tight, whereas the strip *b* will be found to be loose and will buckle.

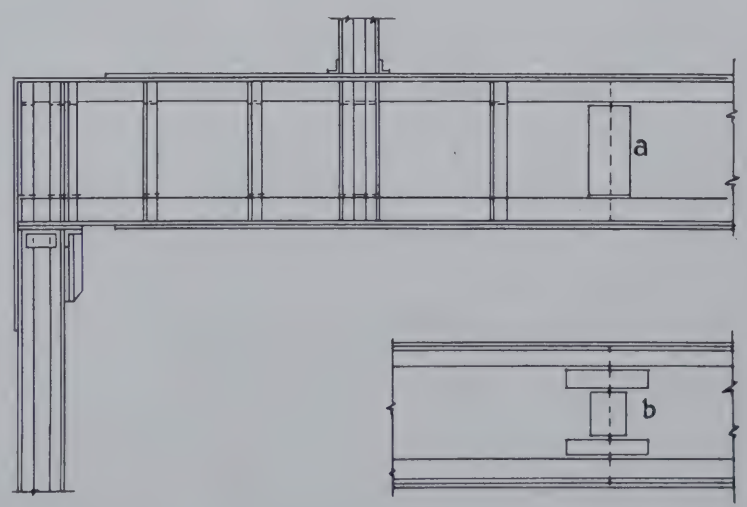


Fig. 10

To prevent this buckling tendency intermediate stiffeners, such as those shown in Fig. 10, may have to be used. These stiffeners may be with or without filler plates and need not be made to bear against the flanges. When there is no filler plate they are said to be crimped over the flange angles. The amount of compression in a strip such as *b* is proportional to the shear in the plate girder's web; its tendency to buckle depends on its length and the thickness of the web, besides the shear per square inch on the web. If the clear distance between the flange angles is too great, stiffeners should be provided to reduce the length of these little columns. They are not true columns, due to the fact that each strip is braced to a certain extent by the metal to either side of it so that the formulae used to determine the spacing of these stiffeners vary even more than those for columns. It would be useless, in this article, to attempt to discuss the relative merits of these formulae.

When the plate girder is too long, say over 30 feet, it may be necessary to splice the web. In Fig. 10 are shown two methods of splicing the web, *a* and *b*. The form *a* may or may not take into account the bending which the web resists. It is common practice to include ⅛ of the area of the web with the flange area in designing the flanges. Whether this allowance is made or not, the web actually does resist bending to a certain extent. Some engineers in designing a web splice as shown at *a*, Fig. 10, do not consider this bending. In the *Engineering News-Record*, Vol. 84, page 949, Mr. Edward Godfrey claims that this practice is all right if no allowance is made in the design of the flanges for the portion of the moment which the web is capable of resisting. He claims that if the rivets do slip a little horizontally, their capacity to resist the vertical shear is not impaired "an iota." The author cannot agree with this statement, for if they

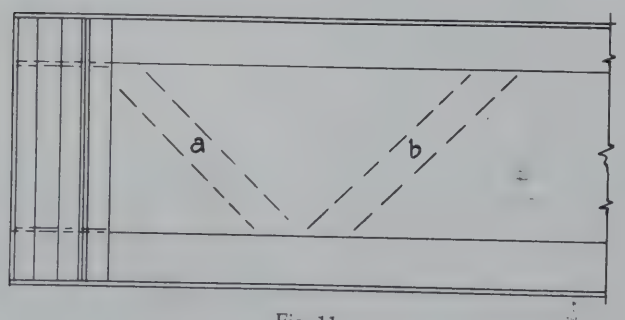


Fig. 11

did slip horizontally they must be resisting a horizontal stress, and if so the resultant of this with the vertical stress must obviously be more than the vertical component alone.

Type *b* for a web splice represents an approximate but safe method. The long plates near the flange angles are figured to resist the bending which the web is capable of resisting, while the middle plates are figured to resist the vertical shear only.

The angles can usually be obtained in longer lengths than the web plate so that the necessity for splicing them or the flange plates does not so often exist. The splice can be effected by putting a short angle over the main angles on either side, and perhaps a short plate on top of the flange plates.

The spacing of the rivets through the flange angles and the web is directly proportional to the depth of the girder and the thickness of the web, and inversely proportional to the shear. The rivets between the flange angles and the flange plates bear

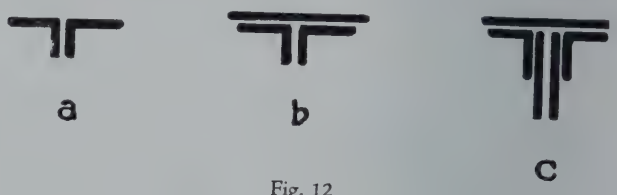


Fig. 12

the same relation to the rivets through the angles and the web that the area of the plates bears to the entire flange area; that is, the smaller the flange plates the fewer the rivets.

The greatest flange area is necessary near the middle of the girder, where the bending is maximum. Therefore the flange plates need not extend the full length of the flanges, but may be cut off at varying distances from the end of the girder. In bridge work it is customary to run one plate the full length of the girder to prevent moisture from entering between the flange angles and the web. In building work this is obviously not necessary.

In Fig. 12 are shown three of the most common types of flanges for building work. These are arranged for light and heavy girders.

The upper flange of a plate girder (unless it is a cantilever) is in compression and has the same tendency to buckle as a column. It is usually possible to so place the plate girder that beams will frame into it at or near its top, thus bracing the top flange. If this cannot be done, the flange should be made as wide as possible, and if this is not sufficient the allowable compression per square inch should be reduced the same as for a column. It is common practice, where the top flange is frequently braced, to allow 16,000# per square inch in the flanges in building work. In bridge work this is not allowed any more than it would be in columns. A formula for the allowable compression in the flanges in plate girders, which would agree in practice with the column formula $16{,}000 - 70l/r$, is $16{,}000 - 200\ l/b$ where *b* is the breadth of the flange. This takes into account that the flange is partially braced by the web and that it is not fully stressed for its whole length, and that the radius of gyration of a section similar to *b*, Fig. 12, is about .25b.

In bridge work when beams frame into the girder some distance below its top, it is common practice to brace the top flange with knee braces setting on top of the top flanges of the beams and extending up against and fastening to the top flange of the girder. This is not usually feasible in building work, as the knee brace might project out into the room and be

in the way. Otherwise it is good design.

The flange angles may be either equal or unequal leg sections. When the unequal leg type is used, it is best to have the long legs horizontal if sufficient room exists in the short leg to get in enough rivets. When the horizontal leg has but one gauge line and the vertical leg has two, it is best not to have more area in the flange plates than in the flange angles; otherwise trouble may be found in getting the rivets through the flange plates. Some specifications require this and provide that the center of gravity of the flange shall not be above the back of the top flange angles. The same care must be taken not to get rivets with too great a grip as is taken in the design of columns. The bottom angles and plates, being in tension, are designed for their net section; that is, with the area of the holes deducted, and it is usually required that the gross area of the top flange shall not be less than the gross area of the bottom flange.



Fig. 13

Fig. 10 shows a plate girder carrying a column and bearing on a column where the webs of the column are parallel to the web of the girder. If the webs of the columns were at right angles to the web of the girder, it would be better to use two girders. Each could be narrow and have its web under a flange of the column. At times it is better to use two girders to avoid the excess depth of a single girder in the building.

No fixed rule can be made for the depth of plate girders in buildings, but in general a depth equal to about 1/10 of the span will work out most satisfactorily. A depth of less than 3 feet is awkward to design, although it can be made down to 2 feet. Special cases require a wide divergence from this rule; in fact, the author has just designed a plate girder for an alteration where the depth was about ½ of the span. This was an extreme condition.

Some engineers, in designing the rivet pitch in the flanges, use the effective depth (that is the depth from center of gravity to center of gravity of flanges), while others use from center to center of rivets. When the plate girder is deep the percentage difference between these two methods is small, but when the girder is shallow it increases and it is best in shallow girders to design both the rivet pitch and the section from the moment of inertia, being careful to deduct for rivet holes in the bottom flange.

A few years ago it was common practice, especially for carrying a wall, to use what was known as a box girder. Such a girder is shown in Fig. 13. It had the advantage of a broad flange, which was good in compression, as was explained in the first article of this series. Care had to be taken, even here, that the plate between the two webs was not too broad for its thickness. Due to the width of flange a wall could readily be built upon it. The chief trouble was that the flange rivets were in single shear, and the designer often forgot to see if it were possible to get in his rivets until the oversight was discovered by the detailer. To avoid this difficulty, it would appear that two girders side by side are much better, and their flanges can be braced together if necessary, so that they will work together to resist buckling.

For very heavy work, more complicated flange sections may be designed. Sometimes they each resemble an I section or a plate and angle column. Another scheme is to use a channel for the flange, with the web flat and the flanges of the top channel turned down. This channel may be replaced by a plate and two angles. These types are especially common in factories to carry a crane girder where lateral stiffness is required to resist the side shock from the moving girder.

The rivets through the intermediate stiffeners need not be very close together. There is no way of figuring this pitch, but 6-inch is frequently used. Some shops prefer to use a pitch such that the rivets will line up with some rivet in the main stiffeners, such as skipping every other one in the intermediate stiffeners.

Column Bases

Column bases are made of either steel or cast iron. For very small struts and columns the bases are made of steel, riveted to the columns. For larger columns the bases are usually separate and made of cast iron. For still larger columns, the bases are made separately and are of cast steel.

In Figs. 14, 15 and 16 are shown the first kind of base. Fig. 14 is for a single-angle strut. A plate is placed under it and the parts are usually held together by a single angle. Another small angle could be placed on the inside of the other leg of the strut. In all cases the bottoms of the struts or columns should be carefully planed to smooth surfaces and care taken that these surfaces be accurately at right angles to the axes of the columns. In Fig. 15 is shown a base for a double-angle strut. Two other small angles could be used to connect the base plate to the strut if desired, these being placed inside the other legs of the angles. Fig. 16 shows a similar base for a small plate and angle column.

In all cases the rivets passing through the base plates should be countersunk on the bottoms. The figure shows these rivets with the conventional sign of a circle with a cross inside, meaning countersunk on the far side. It is usually best to use a ¾-inch plate for the base plate. In Figs. 15 and 14 the connection angles could be ⅜ inch thick, but in Fig. 16 it would be better to make them ½ inch.

When the base extends more than 4 or 5 inches

beyond the edge of the column it is best to make a cast iron base, but some engineers prefer to use a built-up steel base similar to those already described. Fig. 18 shows such a cast iron base, and Fig. 17 a steel base for the same column. If the steel type be used, stiffener angles must be provided on the column. These must contain enough

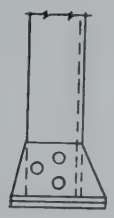


Fig. 14

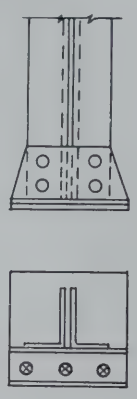


Fig. 15

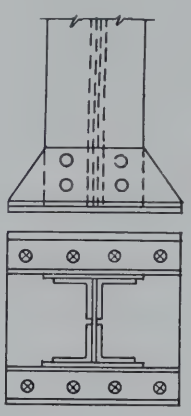


Fig. 16

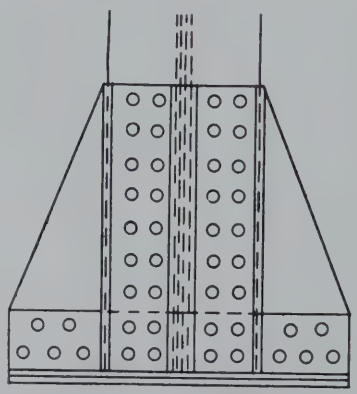
rivets to develop the portion of the base plate beyond the edge of the column. They must also bear firmly against the base angle and be provided with filler plates between them and the large plate known as the gusset plate. The small angles fastened to the base are simply to stiffen the base plate and prevent it from bending between the gussets. The base plate can be ¾ inch thick, and the base angles ½ inch for the long ones and ⅜ inch for the small ones. The stiffener angles and gussets should be ½ inch thick. The filler plate should be the same thickness as the large base angles.

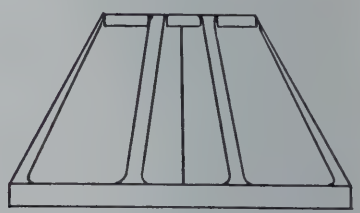
Sometimes even larger and more elaborate bases than this are made in steel. They are often made long and narrow, making the gussets longer. When the gussets become very large they should have angles riveted on the incline, along their sloping edges, to keep these edges from buckling. The cast iron base shown in Fig. 18 is designed for the same column, and is evidently more simple. The three ribs under the column metal should be made at least as thick as the metal above them. The other ribs should be designed by computing the bending and shear, and designing them the same as a beam for their moment inertia and area in ribs.

It is not advisable to use metal of less than 1 inch nor more than 4 inches. Even 3 inches is as thick as some designers care to go. Where the metal is of varying thickness, cracks are likely to develop in the cooling of the material. Care should be taken in designing to avoid this condition, which is especially likely to occur where the ribs meet each other at the corners of the top plates.

The top plate is usually made a minimum of 1 inch in thickness, with large openings in the middle between the ribs to make it possible for the cores to be removed after the metal has hardened. The top plate should be planed on top to provide an accurate bearing for the column. Care should be taken that this planed surface be exactly level. After the base is made, the four holes in the top should be drilled to allow bolts to pass through, fastening the connection angles on the column firmly to the base. These should be 13/16 inch in diameter for a ¾-inch bolt. They should be drilled, and not cored, to insure accuracy.

The two ribs parallel to the web of the column can usually be made 1 inch unless more material be required for shear or bending. The corner ribs are usually from ¼ inch to ½ inch thicker than the others, as they are longer. In the bottom plate are placed grout holes, usually 2 inches in diameter, to allow the grout to flow freely under the base when it is placed in position. These holes may be cored





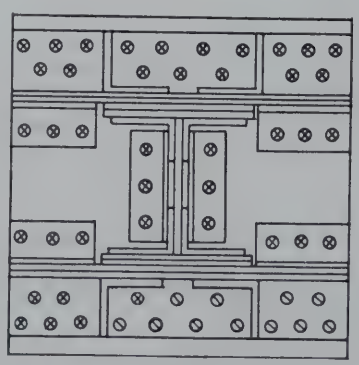


Fig. 17

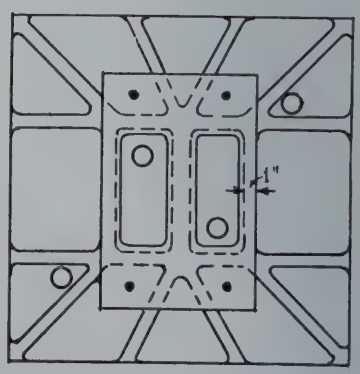


Fig. 18

and they should be so placed that no two will be on the same line parallel to either axis of the base. These should also be placed so as to be as effective as possible in distributing the grout.

When a cast base is placed in position in the building on concrete, it is leveled up by small steel wedges under the edges of the base. Around the top layer of concrete is built a small wooden form and in this the grout in a very fine mixture is poured and allowed to flow under the base until it appears in all of the grout holes and it is certain that the space under the base is entirely filled.

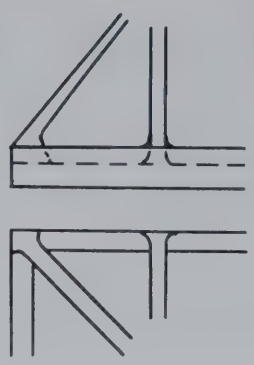


Fig. 19

When the base cools in process of manufacture it sometimes happens that the lower plate warps, forming a curved surface. If this is too marked the base should be rejected. When the ribs meet, or a rib meets the top or bottom plate, there is a slight curve in the material called the fillet. These are usually called for to be ½ inch in radius. They strengthen the base and aid in its manufacture. When the material of the base gets too thick, or is not sufficiently strong to resist local bending between the ribs, a small border may be placed around the outside as shown in Fig. 19. This is usually not over 2 inches in either dimension.

Other styles of cast iron bases are made by various designers, but that shown here is preferred by the author. In one form the top plate is made solid except for the bolt holes, and round holes are provided in the side ribs for extracting the core. In another form the middle ribs form a circle with one across it to carry the web of the column. In such a base the metal of the column does not bear accurately over the ribs below, causing bending in the top plate. It has the advantage of avoiding thick places in the ribs where they meet, as the ribs radiate from the circular rib.

When the column load is large and the metal in the base would be too great to use advantageously in cast iron, it is best to substitute cast steel. This makes a much lighter base, as cast iron in tension is only good for 3,000 # or 3,500 # per square inch while cast steel, like structural steel, is good for 16,000 # per square inch. For buildings not over 11 or 12 stories high, cast iron is usually satisfactory, but for larger buildings cast steel is preferable. When the base rests on grillage beams the bases are considerably smaller than when they rest on concrete, due to the difference in the allowable bearing, and care should be taken, particularly in regard to the shear and direct compression.

In office buildings and similar structures it is not usual to anchor the columns down to the foundations, excepting in buildings where the force of the wind might be an important factor or an uplift be possible, such as at the anchor ends of theater cantilevers. In factories, where the structures would be subjected to shock or vibration, it is common practice to anchor the column bases down to the foundations by means of rods. To make sure that these rods are accurately placed to fit the structural material above, a thin plate is used on top of the concrete in placing the rods in the green concrete to act as templates. These are known as sole plates.

These anchor rods extend down into the concrete to obtain an anchorage sufficient to develop the stress to which they may be subjected. When the concrete footing is sufficiently deep this may be effected simply by the bond of the concrete to the rod. When this depth is not great enough it is necessary to anchor them in some way. A simple right-angle bend has no value as an anchor. It simply adds to the length of the rod to resist slipping by bond resistance. All recognized authorities are agreed on this subject although some contractors argue otherwise.

The full strength of the rod may be developed however by a hook formed by bending the rod around another rod until it is bent around double or an angle of 180°. Some contractors will object to doing this, saying that they have no means of doing it. It is usually an excuse to avoid the discovery of defective material. Rods are often made of an inferior grade of material such as wrought iron or soft steel and if they were bent around double they might fracture. One of the tests required in good specifications for structural steel is that it should be possible to bend a rod double without sign of fracture. When these hooks are made, sufficient concrete should cover them to prevent their straightening out. Another way of developing the rods, is to place plates on the bottom of the rods with nuts under them. The concrete footing might be of such shape that even with such anchorage a piece of the footing could be lifted out by shearing the concrete or the bearing of the plate against the concrete might not be sufficient. This bearing is limited sometimes by the possible thickness of the plate due to its strength in bending. To overcome this the plates might be replaced by channels placed with the webs flat to provide surface for bearing while the upturned flanges resist bending. Angles could be used and a similar endless number of designs as the case might require, as in Fig. 20.

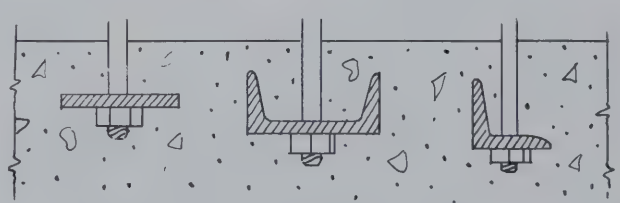


Fig. 20

A New Brick Wall

THE Common Brick Manufacturers' Association has developed a new type of brick wall which it is expected will greatly affect residence construction in America, because the use of this wall, it is claimed, will bring masonry construction down to the level, in cost, of frame construction. The principle of its construction consists of laying all or part of the bricks on their edges instead of flat, and leaving a hollow space between which is bridged at intervals, depending upon the weight on the wall, by headers that bond the two portions of the wall together.

During the recent national conference of the Building Officials of the United States, held at Cleveland, a practical test of the new "Ideal" wall was made. Building commissioners representing cities all the way from Boston to Portland, Ore. witnessed this test and the Ideal wall was the subject of active discussion during the conference.

The accompanying illustration shows how this new method of laying brick was tested, both as to its compression strength and its lateral strength. Two parallel 8-inch walls were erected, 12 feet apart. Each wall was 9 feet high by 12 feet long, with a short perpendicular wall at each end. On top of the walls was placed a floor, and about this was built a wall 4 feet high of the 12-inch Ideal type. The enclosure was then loaded with sand to overflowing. The age of the wall, at the time of loading, was nine days.



Structural Test, Showing Variety of Bonds

In the supporting walls there were four types of Ideal construction. One-half of one wall was 8-inch all-rowlock, with alternate headers and stretchers. The other half of the same wall omitted 50 per cent of the through headers, using bats to replace them. The other wall was one-half rowlock backing, headers every third course and the other half rowlock backing, headers every sixth course. The mortar was 1:1:6, and ordinary run of kiln common brick were used.

The weight of the load upon the base of the wall was 82 tons, which the engineers estimated to demonstrate a factor of safety of 3 over a normal residence load. The walls showed not the slightest indication of stress, and according to V. D. Allen, former Building Commissioner of Cleveland, who planned the test, they could have carried four or five times this load with safety.

The parapet wall upon the top was made 12-inch all-rowlock, which is recommended for foundation construction, and this was subjected to a severe test by the pressure of the tons of sand on the inside of the wall. There were no bracing or supporting rods of any kind, the wall itself bearing the load without defect. The test was conducted by the Common Brick Manufacturers' Association of America.

A number of cities have already accepted this type of wall in their codes for residence construction, and following the engineering tests and fire tests of the wall now being made by the United States Bureau of Standards at both the Washington and Pittsburgh laboratories, more cities are expected to approve it.

In comparison with the solid brick wall, it saves one-third the brick, one-half the mortar, one-fourth the labor, and removes the necessity for furring and lathing, since it is claimed that the wall is absolutely dry when plastered directly on the brick. The lack of necessity for furring is explained by the fact that moisture can be conducted through a brick wall by one route only,—through the mortar joint. There is no danger, even in districts with a heavy rainfall, in moisture being conducted the full length of a header by capillary attraction. The Ideal wall provides a positive break in the mortar joint and eliminates the penetration of moisture from this cause. The 8-inch wall of this type has one such break and the 12-inch wall has two breaks in the mortar joint. In the 12-inch wall there is no material in continuous contact from front to back of the wall. The cavity also aids in keeping the wall dry, by the slight but continuous flow of air within it.

MINOR ARCHITECTURE
EXEMPLIFIED IN MODERATE COST BUILDINGS

Some Post-War Housing Developments in New England

THE HOUSING COMPANY, ARCHITECTS
By TYLER STEWART ROGERS

INDUSTRIAL housing and the housing shortage are inseparably linked together in the economic problems of the day. The housing shortage is due to well defined but not easily remedied causes. It is increasing in importance daily, with little activity yet showing above the horizon to alleviate the relatively acute conditions. Many methods for attacking the problem have been suggested, ranging from tax-exemption schemes to a direct copy of the fatal British government subsidy plan. But after all, though it may seem trite to say so, the only real solution to the problem is the actual construction of houses, and he who builds even one home has accomplished more of real value than the hundreds who talk, criticise and argue over the situation.

The individual family is not yet in dire need, speaking broadly, for no place is yet so congested that people must be housed in tents or other temporary shelters. By the process of readjustment and the use of smaller quarters for each family, we have been able, like sitting on the lid of a full vacation trunk, to get everyone in somehow. How long this packing and rearrangement can go on is hard to determine, but there is a limit to everything.

Many manufacturers have a graver problem on their hands than has the individual, for their interests cannot stop with finding homes for themselves; they must find homes for many of their workers, or else do without their services. The situation has recently changed from the earlier condition, where good workmen's homes were considered a sound investment because they attracted more contented and efficient employes (*i.e.*, a matter of plant efficiency), to the present condition where homes are often essential in order to have employes to operate the plants; in other words, it has become a matter of plant equipment.

This condition varies widely in different centers and in different parts of the country. In the South it has always been a matter of plant equipment, and the only question was how good shall (or must) the houses be to obtain the proper class of employes. This is due to the fact that most Southern manufacturing plants are located in unsettled districts, and from the start have been forced to build industrial villages near the sites of the factories.

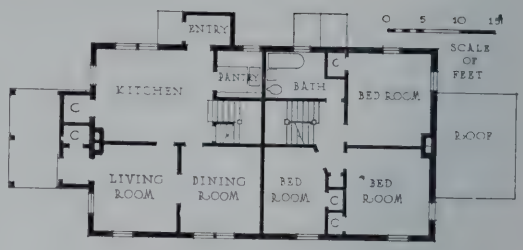
In the North the conditions vary, from a reasonable supply of labor, when the industry is located near large labor centers, to a situation similar to that of the Southern mills when the industry is



View from the North. Housing Development at Newmarket, N. H.



First and Second Floor Plans of Four-Family House

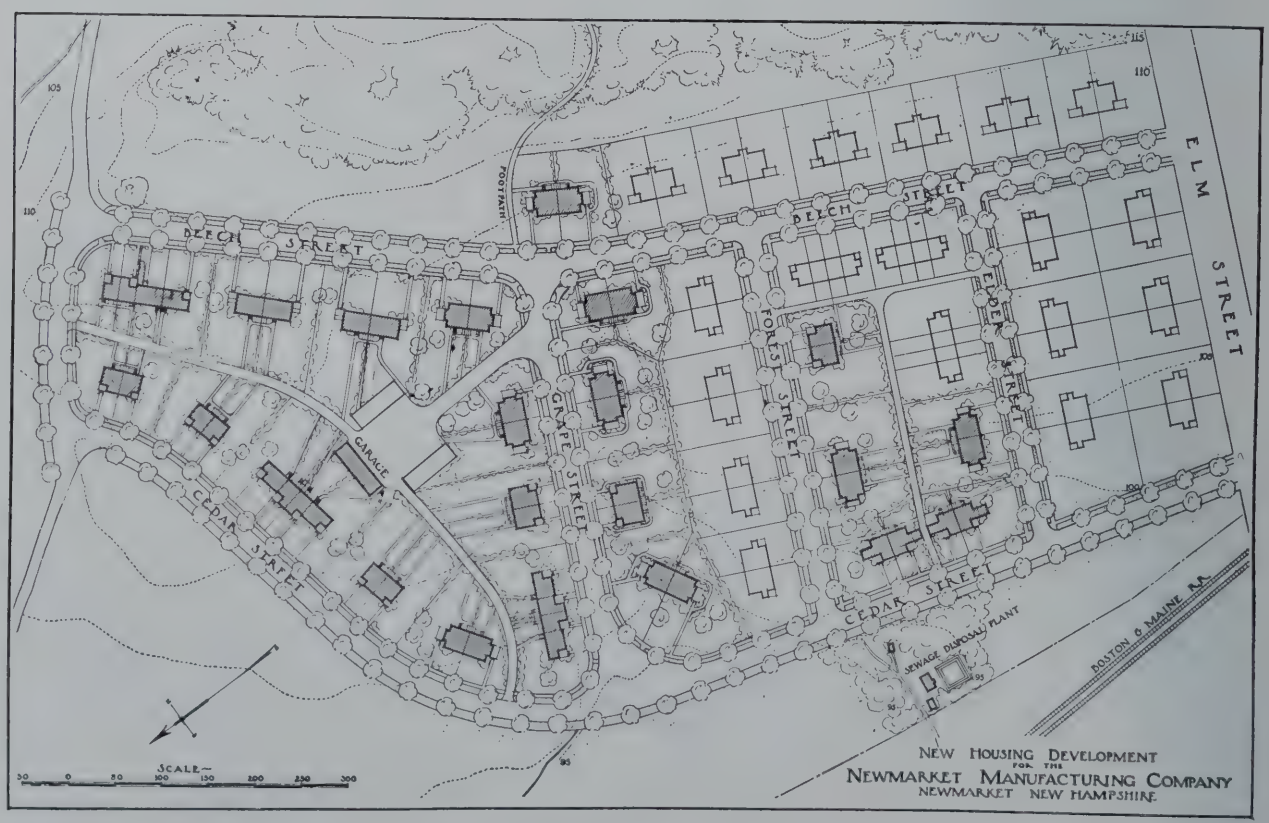


First and Second Floor Plans
Two-Family House, Newmarket, N. H.

located in a small village some distance from the major labor sources. Many New England mills have reached the point where their continued growth is limited absolutely by the housing accommodations of their communities. With little hope of speculative building or the erection of homes by the workers to increase the capacity of their labor centers, these mills have come to the point where plant expansion involves the construction of homes, either directly as a part of the plant equipment, or indirectly by subsidizing other agencies.

This situation, though apparently favoring the city manufacturer, has certain compensations for the village plant. They are the oft-quoted arguments in favor of decentralization, backed up by the favorable experiences of thousands of industries which have moved out into "satellite" communities. There is the increased stability of labor, reducing the waste of excessive turnover; there is the possibility of selecting better types of workers, due to the natural action of the more intelligent people in leaving city congestion for the more healthful suburban locations, and there is plant loyalty, fostered in many places by some form of industrial democracy or shop representation. Then there are such factors as lower land values, resulting in lower overhead, lower living costs resulting in lower wages (without financial detriment to the workers), the possibility of unlimited expansion and the like, all favoring the out of town industry.

The forces which brought about present conditions were observable even before the war, as may be shown by numerous discussions of the subject in architectural and other journals prior to 1917 by housing and town planning experts. The situation was brought to a head during and after the war, so that well informed persons could foresee approximately the results we are now experiencing. Perhaps not many of them expected the extreme delay in reviving the construction industry which has



Plot Plan of Project, Showing Completed Houses



Six Houses of Varying Plans for Skilled Mechanics at Nashua, N. H.



Plans of House at Right

actually occurred, for we were too optimistic to anticipate the present depression.

Nevertheless, the observant ones were relatively few, and those who profited by their observations to take foresighted action were rare. Scattered here and there over the country are housing developments built by industries since the close of the war which attest the progressiveness and forcefulness of the few who saw and acted. These industries anticipated the coming crisis, and solved the problem in the only logical way—by actually building homes. Others, procrastinating, are today where they were three years ago. Though some may say that those who built during the last few years did so at peak costs, the answer is easily found. It must be assumed that housing was needed for the industries to such an extent that even a loss in capital from a real estate point of view would be offset by gains to the industries in other ways. Granted that, then these plants have gained what they sought and have enjoyed its advantages, while their competitors have remained with the same problems, multiplied daily, on their hands. The present depression may give the tardy ones a little respite, but when activity commences the superior position of the plants with adequate housing facilities will testify to the correctness of their judgment.

Such was the position of the majority of the clients whom the Housing Company has served since 1919. The accompanying illustrations and descriptive matter show clearly the manner and character of industrial housing carried out by this firm for New England industries since the close of the war. In discussing the particular projects selected it is not the intention to convey an impression that they are the major developments in New England during this period, or even that they are representative of the most common type of workers' homes. Rather, on the contrary, these projects were selected on account of some distinction in the character of the houses, or by reason of the nature of the problem facing the architects.

There is one characteristic common to all of the developments illustrated, in fact common to all of the work so far done by this firm in New England, and that is the recognition of native architectural precedents. The truly indigenous architecture of this section reflects the puritanical spirit of its settlers, showing, except in the more polished and graceful works of Georgian character, a simplicity, restraint, and even a certain severity of feeling which distinguishes it from the colonial architecture of the Middle and Southern sections. Some people speak of this style as the New England farmhouse type to distinguish it from the more popular style of the larger town houses. Perhaps it would be better to call it the New England small house or cottage type.

Native architecture naturally reflects the climatic character of a region. New England builders have for generations fortified their dwellings against cold, snowy winters and damp, easterly winds by small windows, vestibuled entrances, enclosed cornices and the like. This sort of adaptation to environment is another quality inherent in the work of the Housing Company. Their clients were also influenced in favor of this style of treatment because its characteristics spell economy, and economy was of prime importance in every case, in order to offset inflated building costs.

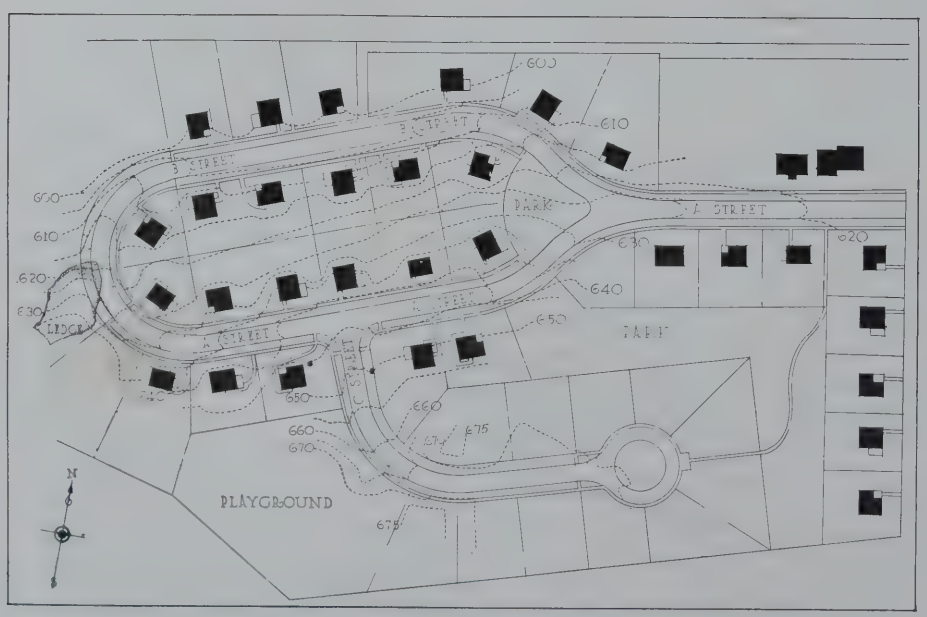
Taking them in the order of their sizes, the largest of the projects illustrated is that for the Newmarket Manufacturing Company at Newmarket, N. H. Twenty-two double or group houses for 50 families were constructed to provide dwellings for opera-



View of Development at West Fitchburg, with Floor Plans of House in Foreground

tives, as well as for overseers and foremen. Grouping the families together was done partly for economy in land and construction cost, partly for the reduction in costs of essential utilities, such as roads, water supply, and sewerage systems, and partly because the houses were to be rented instead of sold to the operatives. Opportunity was thus created for the use of structural units of fairly large sizes, which has resulted in a project distinctive for the solidity and dignity of its buildings and for the impressiveness of the ensemble.

The various types of buildings are built up from relatively few similar units of one and a half and two stories in height. The use of two different story heights has made possible a variation in roof lines, and a diversity of appearance that would not have been possible otherwise. For the most part the buildings are symmetrical in external appearance but occasionally two or more unsymmetrical units have been placed together to build up a street group of good proportions. In general appearance the buildings are characterized by small, well placed windows, adequate and appropriate dormers, and glass enclosed porches. The construction is of brick with asphalt shingle roofs, concrete foundations and lintels, and wood trim painted white. The floors are of rift yellow pine, the inside walls and ceilings of plaster on wood lath, and the interior finish is of N. C. pine. In equipment, all of the tenements are complete in every respect. The kitchens contain ample food cabinets, wash trays, sinks and hot water boilers. The bathrooms have the usual fittings. Hot air one-pipe furnaces and electric lights are provided for throughout.

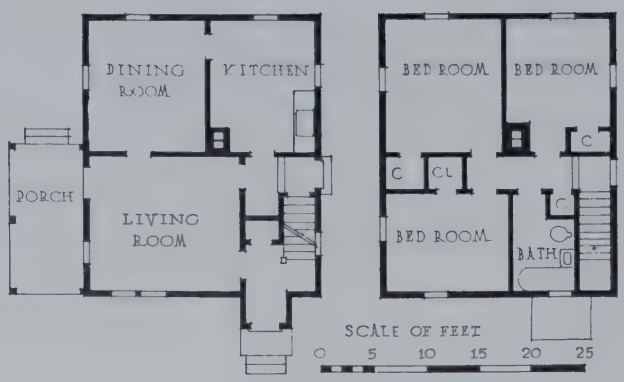


Plot Plan of Housing Development at West Fitchburg, Mass.

The project involved the layout of the tract of land, the development of new streets and the provision of a complete sewerage system with a disposal plant. A community garage, one of three planned for, was built in the center of a large block. Although



Example of Five-Room House Plan



Floor Plans of House Below at Left

no planting was done when the photographs were made, and the houses and streets look rather bare and unadorned, it is easy to visualize the stately character of the tract which will obtain a generation hence with the fine houses covered with vines and shaded by elms and maples. Newmarket bids fair to take an important place in the history of private industrial housing developments, for few projects have been built with such regard for permanence, quality and character.

At West Fitchburg, Mass., is another relatively large housing project of quite a different type. It was designed and built for the Homestead Association, Inc., a subsidiary of the American Woolen Company, to house employes of the Beoli Mills in that town. The two outstanding features of this community, which comprises some 30 houses, are the consistent use of single dwellings of wooden construction, and the topography of the site.

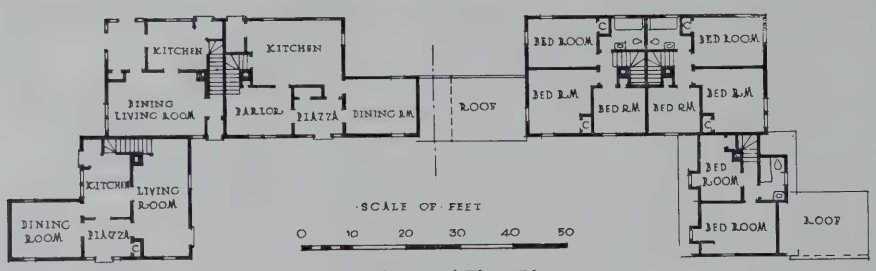
The houses, though of similar character, are of five different types and contain four, five or six rooms each. Both one and one-half and two-story arrangements are used. Outside open porches or open corner porches give wide outlooks from the hill on which the dwellings are built. Rear yards



Houses at Foot of A Street. Development at West Fitchburg, Mass.



Model of Six-Family Group House at Crompton, R. I.



First and Second Floor Plans

are screened off by means of lattice fences which also function to tie the houses one to another, and to lend a continuity of feeling to the development which might otherwise be jeopardized or destroyed by the nature of the site. Each house has complete bathroom and kitchen equipment, a one-pipe heater, and each is wired for electricity. Gas is supplied for cooking. The buildings are of frame with clapboard siding, asphalt shingle roofs, interior walls and ceilings of plaster board, floors of fir, yellow pine or maple, and finish of yellow pine.

The site presented unusual difficulties owing to its position on the north side of a hill, having an average slope of 20 per cent. The houses are arranged around a loop which is elongated to parallel the contours as much as possible. The loop is joined to a main road which leads directly up the hill by a single road which forms the stem to the loop, making a "tennis racquet" on the plan. The maximum difference in elevation across the improved area is 78 feet, with an average difference from the upper row of house lots to the lower row (there are four rows in all) of 60 feet.

The Crompton Company at Crompton, R. I., built two double houses and a six-family group dwelling for some of its employes. These buildings were built of frame with stucco on wire lath walls, and slate roofs. They possess unusually good character, due to their simplicity and excellent proportions, the interesting relations and balance of masses in the group dwelling, and the texture of the expansive plaster walls.

The double houses depart somewhat from the New England type already referred to, and suggest contemporary English influence. The group house, however, hints strongly of our native rambling farmhouses, which have several units of diminishing sizes appended to the main houses in the form of "wings" or "ells." The group house is really a pair of three-family dwellings joined together by an arched opening spanning a service alley. It is interesting to note the similarity between a model made of the group before its construction and the actual building itself, and the faithfulness with which the model conveys a true impression of the finished product. The actual building loses some of its charm because of the badly placed fence posts and the lack of planting in the front yards.

At Nashua, N. H., is another small group of new homes erected to house the overseers and better class operatives of an industry. The Nashua Gummed and Coated Paper Company built six single brick cottages, all of different plan, but all having common characteristics which tie the group together harmoniously. These buildings were very thoroughly constructed, having brick walls, asphalt shingled roofs, plaster walls and ceilings, fir floors and N. C. pine finish, copper screens and complete equipment in the bathrooms and kitchens. Both electricity and gas are available. Hot air furnaces are used in all the houses.

The manufacturers who have thus checkmated the housing shortage by vigorous, constructive action have added to their business many assets that do not show directly on their books, for they have invariably built well and have provided, in spite of high costs, homes that raise the standard of living for their workmen to a plane commensurate with the present-day realization of labor's vital part in the world's work. Thus these manufacturers are winning the good will of labor, they are serving the interests of their communities and the country at large, and they have set an example of constructive optimism which cannot fail to help capital out of its present depression.

It is a particularly notable fact that every project which the Housing Company has undertaken, whether in the South or the North, has included modern bathroom and kitchen equipment and sewer connections.



SIX-FAMILY HOUSE GROUP



BOSTON PUBLIC LIBRARY

TWO-FAMILY HOUSE

HOUSING DEVELOPMENT AT CROMPTON, R. I.

THE HOUSING COMPANY, ARCHITECTS





LIBRARY

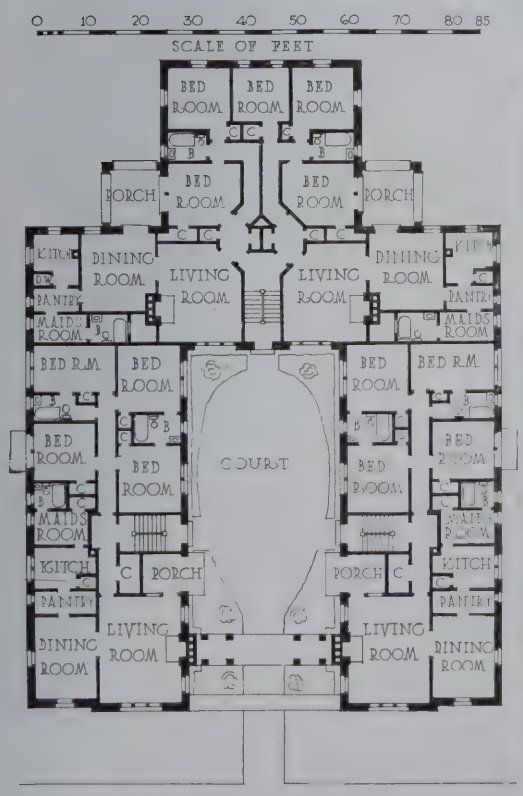
TWO VIEWS OF GROUP HOUSES

HOUSING DEVELOPMENT AT NEWMARKET, N. H.

THE HOUSING COMPANY, ARCHITECTS



GENERAL VIEW



TYPICAL FLOOR PLAN



COURT VIEW

PONDFIELD COURT APARTMENTS, BRONXVILLE, N. Y

HARRY LESLIE WALKER, ARCHITECT



GENERAL VIEW

HOUSE AT NEW ROCHELLE, N. Y.

C. A. PATTERSON, ARCHITECT

Authentic Precedent in Colonial Interiors

IN the architectural development in moderate cost dwelling designs throughout the country there is noted a decidedly quickening interest in the early American colonial types. The result is that many of the new houses throughout the West, and as far South as Texas, are modeled upon the early houses of the English or Dutch colonists.

Architects show a steadily increasing interest in developing their work to include advice as to the furniture and decorations to be used. It is but natural, therefore, that the growing influence of the colonial types of furnishing should interest the architect, since they apply to the problems of interior decoration as well as to those of domestic architecture.

We have been fortunate in obtaining some excellent photographs of authentic English colonial furniture of an early American period. Some years ago an enthusiastic collector of colonial furniture, George T. Ives, of Danbury, Conn., removed from the Old Post Road at Brookfield, Conn., to another point on the same road in Danbury, an old building constructed in the seventeenth century as a tavern to serve the stage coach route which was operated on the Old Post Road between New York and Hartford, via Litchfield and Farmington. This building was carefully taken down and rebuilt in its new location. It has since been used by Mr. Ives as a home, and it provides a logical setting for an unusually interesting collection of colonial furniture; in fact the interiors of the old tavern are practically unchanged. Naturally, this collection of furniture and decorations, representing the result of a lifetime of interest and effort on the part of an enthusiastic collector, offers many instructive suggestions and serves almost as a textbook illustrating authentic types of early American furniture.

The active interest in colonial furniture, which for many years has been in evidence in the Eastern section of this country, has naturally led to the adaptation of various types for commercial reproduction. It is found, however, that in many instances the real colonial precedent has been almost lost sight of, and that in the course of such commercial production graceful lines and contours have often been much changed to meet the demands of the processes of manufacture or to cater to the supposed taste of purchasers. Among architects the interest in colonial furniture is general, but opportunities for examining authentic pieces are comparatively



Entrance Hall Looking into Tap Room (Fig. 1)



A Corner of the Dining Room (Fig. 5)

few, particularly in the West and South. It may be helpful, therefore, to illustrate a number of types of such furniture and decorations, and to give brief descriptions of the rooms with a classification of their furniture, since in this way a document of definite reference value may be added to the architect's collection of data on furniture and decoration.

Fig. 1 is a view of the main entrance to the tavern, looking into the tap room. Of particular interest is the iron hardware on the large entrance door, and the door itself, with its panels flush with the rails and stiles. Turning into the tap room, Fig. 2 (illustrated in the following plates) shows the interesting furnishing and equipment of the bar room of early American days. Studying the illustration from left to right several pieces of particular interest include a large wing rocker which, it may be noted, belonged to General Putnam. The settle is of paneled pine, aged to a soft brown. The mantel and the door at the left of the illustration are, of course, of a later date, though it may be noted that the simple, graceful paneling of the door is of particular interest as a study in proportion. The walls and ceiling of this room are painted a soft old rose color. Woodwork is of white pine throughout, and the floors are of natural gray oak.



Dining Room Looking toward Bedroom (Fig. 4)

The rugs used in this room are of the braided rag and hooked types. It is interesting to note the complete bar equipment of the old days, as shown in the cupboards to the right of the fireplace. Numerous graceful fixtures for candle lights are to be noticed.

Another view of this same room, Fig. 3, (on a following plate) shows a "Carver" chair, an "Elder Brewster" chair, a butterfly table, and a comb-back Windsor chair with a writing-arm. The tall clock is an excellent piece of cabinet work, executed with the simple lines of the period and it brings out the full-grain effects of curly maple. Throughout these interiors the painted window shades may be noted, each carrying an outdoor scene, accentuated as the daylight passes through the shade.



Parlor with Entrance Doorway (Fig. 6)

Figs. 4 and 5 show different views of the dining room. This room has the same gray oak floor with accentuated grain, due to the wearing process of years of cleaning. The walls are of white pine paneling, and here they are painted a pumpkin yellow, with simple white curtains at the windows. To the left of Fig. 4 will be noted a curly maple spread-leg table. Next to this is a pine cellarette, while in the corner is to be noted a gate-leg table especially designed to fit in a corner. The large



Room Known as Ladies' Parlor (Fig. 7)

table is also of the gate-leg type, and the chairs are comb-back Windsors. The sideboard is of particular interest. It is built of pine, showing the natural grain and having a small amount of painted ornamentation. The lines of this sideboard are particularly graceful, suggesting a later English period.

Other illustrations, Figs. 6 and 7, are views of the ladies' parlor. It will be noted that this parlor has a private front entrance. In Fig. 6 there is shown an unusually fine example of a fireside chair. It will be seen that the wings of this chair are of carved curly maple, a very unusual and attractive feature. The clock shown in this illustration is known as a grandmother's clock. Usually we hear of the grandfather's clock, but the grandmother's clock is of a smaller type and not quite as imposing as the usual grandfather's clock. The chest of drawers is of pine wood, with scalloped base and attractive fittings. In the other view of this room, Fig. 7, there will be noted a chest of drawers resting on legs and stretchers and known as a high boy. The type of bed shown is known as a "slaw bed." This is probably the forerunner of the ubiquitous door bed, as it is designed to fold up, and the canopy curtain is pulled out to conceal it. These beds were often used in the old taverns, and were held in reserve for unexpected or extra guests. At the foot of the bed will be noted a chest which was used for the storage of blankets. Here again the writing-arm, comb-back Windsor chair with back braces is in evidence, this example being of the rocker type. On the wall will be noted an unusually fine old hooked rug. The chest of drawers is of decorated pine. Here the floors are completely covered with carpet, and the hangings are of flowered fabric in subdued colors.

A glimpse into the old ballroom, Fig. 8, shows extreme simplicity of furnishing. In the corner may be noted a pile of hand painted bandboxes, much used in this period, and in attractive, brilliant colors. Here again, the painted window shades are in evidence. Over the pine settle hangs the old tavern sign, showing the coat of arms of Connecticut. The arm chair in the background is one originally made for George Washington. Next to this is an interesting Windsor settle with fingered arms. To the right of the settle may be noted a banister-back arm chair, and in the right foreground of the picture is a small settle of the type known in the colonies as a "wagon seat."

Illustrations such as these are useful in showing the kinds of furnishings which are appropriate for use in an interior of the early English colonial type. Many of the pieces of furniture, and some of the accessories, may be had in excellent reproductions, and rugs of both the braided and hooked varieties are now being made again and may be had in any desired colors and of almost any size. Many architects have found that clients are readily interested in acquiring suitable furnishings, and that with even a few suggestions pointing out the desirability of furnishing with consistency, an interest has been awakened which often leads to surprising results.



The Old Ballroom (Fig. 8)





TWO VIEWS OF TAP ROOM (FIGS. 2 AND 3)

RESTORATION OF OLD TAVERN AT DANBURY, CONN.

SHOWING FURNITURE COLLECTION OF GEORGE T. IVES, ESQ.



LIVING ROOM MANTEL

HOUSE OF JAMES A. BURDEN, ESQ., SYOSSET, L. I., N. Y.

DELANO & ALDRICH, ARCHITECTS

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

Developing the Constructive Force of the Architectural Profession

OUT of all the editorial comment which has been made on the subject of advertising by architects, and publicity which would tend to place the profession more favorably before the public, there apparently have been no practical suggestions acceptable generally to architects. It may be well at this point, therefore, to restate certain facts and conditions which on several occasions have been brought before the profession, regarding the changing conditions under which the architect is operating today.

It is now evident to all within the profession that architecture must receive serious consideration as a business, as well as a profession. The need for a broader public understanding of the responsibilities and activities of the architect is evident. To those who understand the diversified character of the architect's work, and of the demands which are made upon him, there is no need of justifying his logical position in the economic structure. Unfortunately, however, there is but one phase of the activity of an architect's office which ever comes to the attention of the public—the artistic phase, as evidenced in the design of buildings of every type, which may compel attention because of their interesting character. The work of the architect in connection with the development of a building project passes without recognition. The detailed efforts of preparing working drawings and specifications, which make possible the construction of a building according to the demands of economy and practical utility, pass for very little from the public viewpoint. As the building is being erected it is the building contractor who receives publicity.

One reason for the existence of this condition (with due regard to such associated effort as may have been made in the past by architectural organizations), is that there has been little constructive effort made locally by architects, individually or in groups. As a body in each community, architects have not functioned conspicuously on local problems, except in a few striking instances. Recently the writer had the opportunity of observing rather closely some of the work which had been done in Chicago by the Illinois Chapter of the American Institute of Architects and by the Illinois Society of Architects. This has been particularly in reference to suggested changes in the building code of Chicago. The actual details of such activity and the results which may be forthcoming are not of particular importance to this discussion. *A distinct impression left by our observation, however, has been that possibly through such constructive effort there at last opens up a channel through which the architectural profession may come definitely before the public in matters of public service.*

If we may digress for a moment, it is advisable to again point out the fact that the architect is constantly thinking and working in terms of one of the most important economic elements affecting the daily life of every person. This is the element of *shelter* as represented by buildings of every nature. Homes constitute the most important single factor in social life and intercourse. Today the housing problem is so acute that the attention of everyone is directed to this question, and the daily press, as never before, gives consideration to home building because it is actively in the public interest. Buildings are the most important tools of industry, for without them we should have no production and no commerce.

Digressing still further, we may now call attention to the lack of uniformity in building codes in various cities and towns throughout this country, and to the fact that the average code contains restrictions as to types of building materials and limitations as to construction practice which have a directly detrimental effect on the cost of building construction. This is because in many instances such codes entail the use of unnecessary quantities of material and an over-demand of structural precautions, and also because through the barring out of materials which have been developed to a point of sound utility, competition is decreased.

Having in mind the facts already outlined, it has occurred to us that here may be an opportunity for bringing the architectural profession, in local units, before the public in no uncertain way, gaining thereby favorable and proper publicity for the profession as well as a wider recognition by other business interests which contribute to the industrial, commercial and civic development of every locality. The fact that architects can get together and wield direct influence toward the correction of unfavorable local building conditions and restrictions has already been shown in several instances, but the need for leadership in this activity is evident. We believe, therefore, that now is the time for architects, either through already organized bodies or through the formation of local organizat ons, to take their proper position in relation to public activities of various forms, and in actual leadership toward the correction of unfavorable conditions, opinions, laws and codes.

Practical Results Under Fixed-Fee Building Contracts

IN another article in this Department we have outlined the complete service rendered by one architectural organization. Naturally, there are but few organizations which are equipped to carry out complete building projects in this manner, but, as we have suggested in various articles in past issues of THE ARCHITECTURAL FORUM, a somewhat similar service may be developed by architects through co-operation with practical builders under the fixed-fee type of building contract.

As a result of the discussion on the subject of the cost-plus-fixed-fee contract, we have received from architects a number of letters covering various points involved in this relationship. One question, almost invariably asked, relates to the actual advantages to be gained by letting out a building project under this type of contract. While we have discussed the theoretical advantages before, we have found it interesting to investigate the actual experiences of several large firms of building contractors who work exclusively under this form of contractual relationship.

In discussing this matter with contractors who work on the fixed-fee contract basis, we have found no apparent attempt to bring in an element of "coloration" to support the cause of this type of contract. Naturally such firms are interested in working on this basis, but where they are properly organized to render service it is evident that a service which brings them closely in touch with the interests of architect and owner will have good results if the builder knows his business.

While discussing this subject we have been impressed primarily with the importance of selecting a builder on a competitive basis. At first thought it would seem that competitive bids could not be taken under the cost-plus-fixed-fee type of contract, but it was suggested by the builders themselves that competitive bids might be taken, if due attention were paid to these several points:

1. The business standing and experience of the contractor.
2. The amount of fee required as payment for carrying out the work.
3. Willingness of the contractor to include a penalty clause, which would reduce his fee in case of excess cost.
4. Amount of bonus on saving over estimated cost.
5. The estimated cost of the work, and methods by which this cost is determined.

While it is true that the contractor is assured of at least a portion of his fee, there is no reason to believe that a contractor who is carrying on his business in a sound manner would be so blind to his own interest as to become careless or inattentive to costs. Certainly if the contractor has carried out work to the satisfaction of other architects and owners on this basis, it is not likely that his work will be any less satisfactory in the future than in the past. It was found that the close co-ordination of the architect's and contractor's forces in designing, listing, purchasing, shipping and building was of direct value to the owner in saving duplication of effort. This type of contract works most favorably when the contract is awarded before working drawings and specifications are complete. This makes it possible to bring in the contractor and to allow him ample time to deal with sub-contractors.

In examining the results of the operation of the fixed-fee contract on two buildings—one large and one small—now under way, we have found that the spirit of the work is excellent. The owner, architect and contractor meet once or twice a week to discuss the progress of the operation and any required changes. The contractor, being assured of the work and not hurried by the necessity of meeting competitive bids for the general contract, is able to work directly with the architect and to incorporate in the requirements of plans and specifications any such changes as might be made desirable by market conditions. More time is given, in this manner, for sub-contractors to familiarize themselves with the requirements of the work, and a large part of the necessary material and equipment has been purchased while the plans were still under way. The architect, owner and contractor all work in direct co-operation to get the best possible figures on materials and sub-contracts. This involves good bargaining and good judgment, with full consideration of the owner's interests, which might not be possible under a lump-sum contract method.

Many types of building projects involve numerous changes after the contract has been let. Such changes are usually represented by "extras" under the lump-sum contract, but with the fixed-fee method it is possible to incorporate changes, sometimes at no cost to the owner, or at minimum cost of materials and labor. Where there are many changes on a building the contractor who is working on the lump-sum basis may legally and properly claim compensation for extras, which may run into large figures. When the builder's fee has been fixed in advance, however, any changes which are suggested by him, or which the architect or owner may decide to make, do not add to this fee.

The element of time saving is a particularly advantageous factor. On a fixed-fee basis the contractor may proceed immediately with the purchase of materials and the arrangement of sub-contracts and may go ahead with excavation, foundation, and other work possible without waiting for finished working drawings.

On the two contracts to which we have referred, it is claimed that approximately two months were saved in the time of delivery of the completed buildings. In one of these instances this saving of time meant that the rentable space was made available

during the renting season, in time to create income on a heavy investment and to arrange advantageous leases.

After carefully studying the working of the fixed-fee contract, we feel that architects will do well to give this subject serious consideration. It is particularly important at this time that every possible means for cutting down the cost of construction should be developed, in order that additional building may be encouraged. Competitive building on a lump-sum basis does not always represent the lowest actual cost to the owner. The manner in which some architects and builders are cutting down building construction cost today involves:

1. A careful study of the most economical building materials and equipment, from the viewpoint of labor cost as well as the actual cost of materials.
2. In obtaining sub-contracts on the work the number of bidders is materially increased, in order that a wide range of selection may allow for closer bargaining.

It is evident that some architectural firms are so organized that they can undertake the economical arrangement of sub-contracts and material purchases. On the other hand, there are many architectural offices not equipped, by either knowledge or experience, to delve deeply into the subject of sub-contract figures and actual prices of materials in necessary quantities. Here the service of the contractor under the fixed-fee plan of operation will prove invaluable. This arrangement provides the necessary time to develop keen competition on the part of sub-contractors and to locate material supplies available for the work at the lowest costs which the market affords. The material markets today may be termed "spotty." Here and there will be found odd lots of material which the architect may have no means of knowing about, but of which the builder may be aware because of his more intimate relations with material dealers and transportation possibilities.

We believe that the greatest benefit offered by the fixed-fee type of contract is that the contractor's force really becomes the necessary skilled branch of the architect's service to the owner. Thus the need of self protection, which is necessary under a lump-sum contract, is eliminated as far as the building contractor is concerned. He can at once become an active and dependable partner of the architect, and join forces as an interested party in getting the best results under difficult conditions. Naturally, not every building contractor's organization is fitted for such work, nor can every organization be depended upon to render the necessary services under this form of contract, so it remains for the architect to recommend the services of only organizations bearing sound reputations for work performed under these conditions. It may be remembered also that a number of comparatively new contracting organizations have been developed to work on this basis. Here the personnel of the organization should be the deciding factor, and if it seems that such an organization is composed of individuals possessing broad experience in this type of work, the possibilities presented in employing such an organization should not be overlooked.

The first requirement, therefore, when an architect selects a building organization to work on this basis, should be that the builder has a reputation to protect or a record to make. If this is his greatest incentive, it means the introduction of what loaning institutions term a "moral risk"—an element which is every day coming to play a more important part in commercial transactions.

An Organization Which Renders a Complete Building Service

AT this time the architectural profession is giving serious consideration to various important details of organization development, such as service, publicity and advertising. We have, therefore, read with interest a booklet recently issued by the firm of Preston J. Bradshaw, Member A.I.A., St. Louis, entitled "Modern Architectural Practice," which contains a brief description of the organization, its scope and methods.

The opening paragraphs constitute a definition of service as it applies between the architect and his clients. Before actually commencing plans, the first element of service covers the economic phases of the problem, the various elements of this preliminary service being:

To thoroughly investigate and analyze a building problem.

To suggest the class and size of structure most appropriate for the particular site.

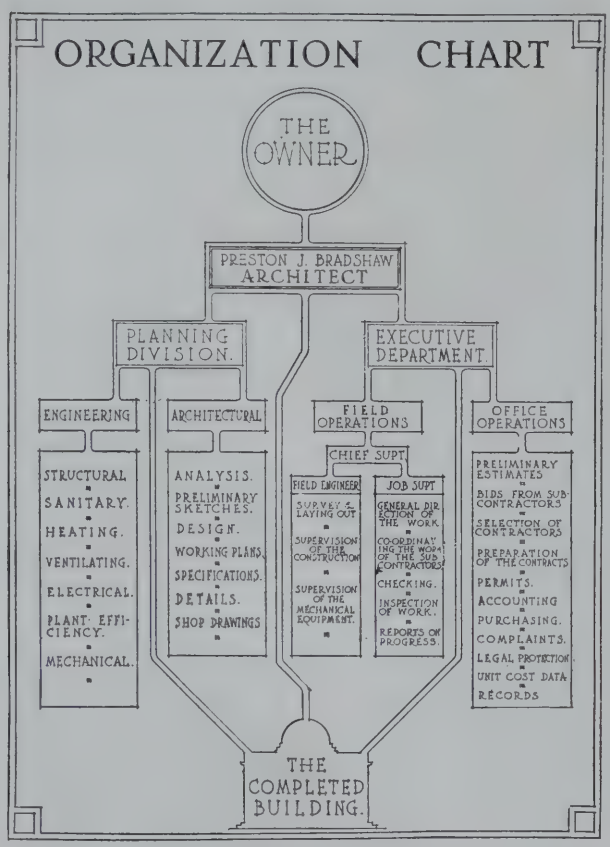
To survey neighboring buildings and approaches.

To recommend a building suitable for the class of tenants to be accommodated.

To make a thorough analysis of materials best adapted to the program contemplated, and then to submit a comprehensive report of findings.

An interesting method of keeping closely abreast with building costs is in use in this office. A group of key plans for typical buildings is maintained, on which bids are taken periodically in order that an accurate cubic foot cost basis may be available for use in estimating the costs of new buildings of various classes. This, or a similar method of maintaining dependable cost figures, will be found invaluable in every active office, and we have already laid stress repeatedly on the importance of having accessible dependable estimates of costs during the period of the development of plans and designs, in order that the client may not be disappointed when final costs of building are obtained.

After preliminary plans are drawn, in this St. Louis office, they are passed on to an engineering department where the structural, heating, ventilating and sanitary details are incorporated. Meanwhile, as the plans develop, specifications are written and costs are taken in order to eliminate changes in the final plans. It is interesting to note that this organization maintains an extensive reference file of plate illustrations, showing new buildings developed in all sections of the country, and that cost data is incorporated in this file, wherever possible.



The work of this organization does not end with planning and supervision; a special department has been developed to act as agent for the owner in carrying out the construction, through a series of sub-contracts, which means dispensing with the services of the general contractor. Under this subletting method of handling building projects, these several functions are undertaken by the architect, after complete plans and specifications have been prepared:

Securing bids from reputable sub-contractors, covering entire operation.

Checking these bids with the specifications and quantities.

Listing the bids, and submitting them to the owner for his approval.

Preparing proper contracts between the owner and the sub-contractors.

Obtaining bids, and surety bonds when required.

Securing all necessary permits from the building department, street department, etc.

Auditing all accounts, and issuing certificates for payment to the various sub-contractors.

Operating a complete field force of superintendents and engineers.

Expediting the work of sub-contractors to eliminate delays.

Preparing both progress and completion reports on the work.

Securing clearance on bills, and waivers of liens against the property.

The benefits under this plan of operation are claimed by the architects to be:

Saving of time by dealing directly with sub-contractors.

Immediate and uninterrupted communication between the drafting room and the work on interpretation of plans.

Absolute jurisdiction over details, time of completion, and the distribution of funds, as the sub-contractor comes direct to the architect for certificates of payment, thus permitting enforcement of proper and speedy execution of the contract.

The direct selection and purchase of all materials which enter into the construction of the building.

This is a firm of architects—not contractors in any sense of the word. They do not employ labor, but act as agents for the owner in the employment of sub-contractors, and all the elements of service as given by this office are in entire accordance with the principles laid down in the recently published Handbook of the American Institute of Architects.

While every architect is not in a position to maintain an equally extensive organization, the principles indicated by the scope of the service here described may be applied to the business of every architect, regardless of the volume of work which passes through this office. We are informed that throughout the Middle West the sub-contractor method of carrying out the construction of moderate cost dwellings is employed in at least one-half of the architects' offices. In some cases which have been brought to our attention, architects working for speculative builders and real estate developers are carrying out complete designs of dwellings and are letting sub-contracts for construction as agents of the owners. The architect then supervises the work and co-relates activities of sub-contractors in order that construction may be carried out quickly and with the least possible friction.

In building moderate cost dwellings, it is customary to divide the construction into five or six sub-contracts. Bids are taken on these, which include the provision of necessary materials. The contracts are then placed, not always with the lowest bidder, but on the conditions which seem to insure the most satisfactory service from the viewpoint of the owner. The customary charge on small house work of this nature seems to be 10% to cover the complete service of the architect.

A Group of Stores at Southern Pines, N. C.

AYMAR EMBURY II, ARCHITECT



Block Containing Hotel and Stores on 190-Foot Frontage

MUCH of the badly mixed appearance of the buildings facing the streets of American cities and towns is due to lack of co-operation on the part of property owners for harmonious development upon some definite plan. Each owner avails himself of every man's inalienable right to build what he will, and the result is the heterogeneous rows of buildings which may be studied in almost any town. A plan by which each building would be a part of a well arranged development would mean a successful architectural result, which cannot fail to increase the value of each of the individual holdings as well as of the locality in general.

An instance where co-operation has achieved highly successful results exists at Southern Pines, N. C., where three owners agreed upon a form of treatment in which each building should contribute its share to the appearance of the group as a whole. The two-story building upon the corner at the left, which seems to be three buildings, belongs to one individual and contains stores upon the ground floor and a hall with reception room and suitable offices above. The three-story structure farther to the right is the front of a hotel which occupies the greater part of the block and which faces also upon the side street. The plans show stores upon the lower floor and the hotel departments elsewhere, all surrounding an open court which provides light and air as well as a private entrance to the hotel and delivery entrances for the stores. By this plan most of the bedrooms are away from the railroad which is across the street from the front of the hotel. The two-story building at the right of the group belongs to a third owner and contains two stores and two apartments, the space behind being occupied by four garages which are reached from an alley.



First and Second Floor Plans, Indicating Property of Three Owners

EDITORIAL COMMENT

THE YOUNG MAN IN THE PROFESSION

MUCH attention has recently been directed to the problem of the relations of the draftsmen to the profession; the obligations resting upon the architect in giving draftsmen in his employ opportunities for acquiring a broader and more general conception of professional service, and the means for supplying in another manner the advantages that are held out as an inducement to extend the scope of the so-called draftsmen's union.

Organizations within the profession or among men so closely identified with it as draftsmen, which partake of the nature of groups for collective bargaining will certainly be detrimental to the good of architecture. The work of any of these men more nearly approaches an art than a trade and its success depends upon a healthy individual enthusiasm which is quite contrary to the principles of mass action as now maintained by unions.

The subject, however, cannot be dismissed with this statement and allowed to take its own course. There is an undeniable sentiment today that results are not produced by the will or power of any one man; the problems are too large and complex to make this possible. Work of any kind accomplished today is the result of co-operation on the part of many, each contributing some worth while element. This is recognized by those who fill the various roles and it is but natural they should consider it fair and proper that their function and value be admitted.

The average draftsman is a man of good breeding and intelligence who has a fair knowledge and appreciation of architecture. Most men in becoming draftsmen do so with the aim and intention of ultimately becoming architects; certainly men graduated from the architectural schools who must of necessity acquire their practical experience through drafting have this intention. In how many cases, however, do they find opportunity for getting the necessary knowledge and experience to become architects, or in fact well-rounded assistants in their employers' offices? They are engaged without any contract; their stay in the offices depends usually upon steady maintenance of work; if there is a lull between commissions, they are dismissed and new a force taken on when work picks up again.

It is not unreasonable to expect that after a number of years of such employment the enthusiasm of becoming architects has been dulled and if they remain in the profession, they are reconciled to remaining employes and take only such interest in their work as is necessary to keep their employment. The best of architecture cannot be produced with assistants of this calibre, neither will it be produced if these men become associated with unions that by means of collective bargaining secure only monetary advantages.

There is a middle ground that will prove effective; it will require a real and lively interest on the part of architectural societies—perhaps the Institute and its Chapters—but the fundamental interest which every draftsman has in architecture supplies a beginning of substantial character. We believe a model for accomplishing much good has been set up by the Boston Society of Civil Engineers and because of the similarity of the problem in both professions the chief points of its program are outlined.

In its effort to better its service, the Boston society considered means of securing the interest of the young men. Conferences were held with them, resulting in the conclusion that discussions of designs and designing methods would prove of interest and value. It was further determined that the society work of the young men should be managed by themselves and to accord with their convenience and desires. A nucleus of about forty men was recruited chiefly from the designers; some were already members of the society and the others became members to secure the advantages of the young men's section.

The meetings are arranged to suit the ideas of the men themselves. They begin at 6 o'clock and last about two hours. About half the time is given to the presentation of a subject and the balance to discussion. The sessions are entirely informal, manuscripts of the papers are not required and no stenographic record is kept. Questions are encouraged and the blackboard and stereoptican are at hand to illustrate difficult points.

It has been found that the greatest interest is aroused in meetings in which actual designs are discussed rather than pure theory. It is usual for the speaker to select a design that has recently been developed in the office with which he is connected and the discussion that follows results in a general interchange of ideas that is most helpful.

The Boston Society has wisely recognized two important qualities of youth. These young men are energetic and they want to do things, and furthermore they want to do things in their own way. By encouraging these qualities and placing confidence in their ability to carry them out, a most successful section of the society has been instituted and in addition to enlarging the membership it makes possible in the young men a keen professional interest in their work which is reflected in their office associations.



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Manufacturers' Catalogs and Business Announcements

ANNOUNCEMENTS

Murphy & Dana, architects, announce that R. H. Dana, Jr., and J. Duncan Forsyth have withdrawn from the firm and that the three remaining members will continue the practice of architecture under the name of Murphy, McGill & Hamlin, 331 Madison ave., New York, and Union Building, Shanghai, China.

Ingham & Boyd, architects, announce the removal of their offices to the Empire Building, Pittsburgh.

Dubin & Eisenberg, architects and engineers, announce the removal of their offices to Suite 720, Browning Building, 14 W. Washington street, Chicago.

Chester E. Wolfley wishes to announce his withdrawal from the firm of Wolfley & Eliel, architects and engineers. He will continue the practice of architecture under the name of Chester E. Wolfley —Architect, with temporary offices at 610 Stewart Building, Rockford, Ill. Manufacturers' samples and catalogs are desired.

Alfred H. Wheeler, architect, announces his removal from the Globe Building to 407 Metropolitan Bank Building, 5th & Cedar streets, St. Paul, Minn.

Horace G. Cook, Jr., announces the removal of his office to 716 Miners Bank Building, Wilkes Barre, Pa. Manufacturers' samples and catalogs requested.

Miss Marcia Mead, architect, formerly practicing under the firm name of Schenck & Mead, will continue the practice of her profession under her own name at 248 East 34th street, New York.

The architectural practice formerly carried on under the firm name of Freney & Jackson, 51 Leavenworth street, Waterbury, Conn., will be conducted by Thomas M. Freney at the same address.

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Walter Thomas Williams, architect, announces the removal of his office to 41 East 42nd street, New York.

Charles F. Allen, architect, announces the removal of his office to Room 206, Touraine Building, Ft. Worth, Tex. Manufacturers' catalogs and samples requested.

Messrs. Bowdoin & Webster, architects, formerly at 299 Madison avenue, announce their removal to 70 East 45th street, New York.

Townsend, Steinle & Haskell, Inc., architects, have removed their offices to 8 West 40th street, New York.

Kendall, Taylor & Co., architects, announce the removal of their offices to 142 Berkeley street, Boston.

James E. Camassa, architect, formerly at Worcester, Mass., after service in the U. S. Army, resumes practice with an office at 196 Hanover street, Boston.

Monaco & Wright, architects, announce the removal of their offices from 168 N. Michigan avenue to 721 N. Michigan avenue, Chicago.

Henry C. Pelton, architect, announces the removal of his offices to 151 West 42nd street, New York.

Henry T. Child, architect, has removed his office from 29 Broadway to 280 Madison avenue, New York.

The Dahlstrom Metallic Door Co. announces the removal of its offices from the Consolidated Gas Bldg. to the new Cunard Bldg., 25 Broadway, New York.

Alfred C. Clas wishes to announce that he has entered into a partnership with John S. Shepherd and Rubens F. Clas for the general practice of architecture under the firm name of Clas, Shepherd & Clas, at 202–206 Colby-Abbot Bldg., Milwaukee.

John Noyes announces that he has opened an office for the general practice of landscape architecture and engineering at 119 North Seventh street, St. Louis. Manufacturers' catalogs requested.

James T. Narbett, architect, has opened an office at Room 503, Easton Bldg., Oakland, Calif., for the practice of architecture. This office will be operated in conjunction with his Richmond, Calif., office.

George A. Bagge announces the opening of an office at 299 Madison avenue, New York, for the practice of architecture, under the firm name of George A. Bagge & Sons.



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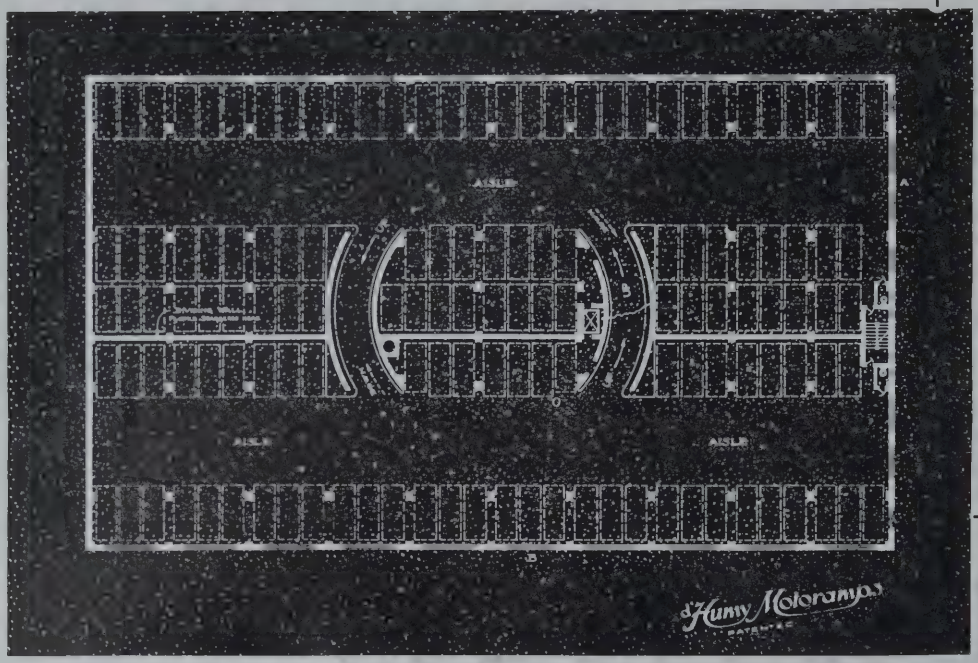
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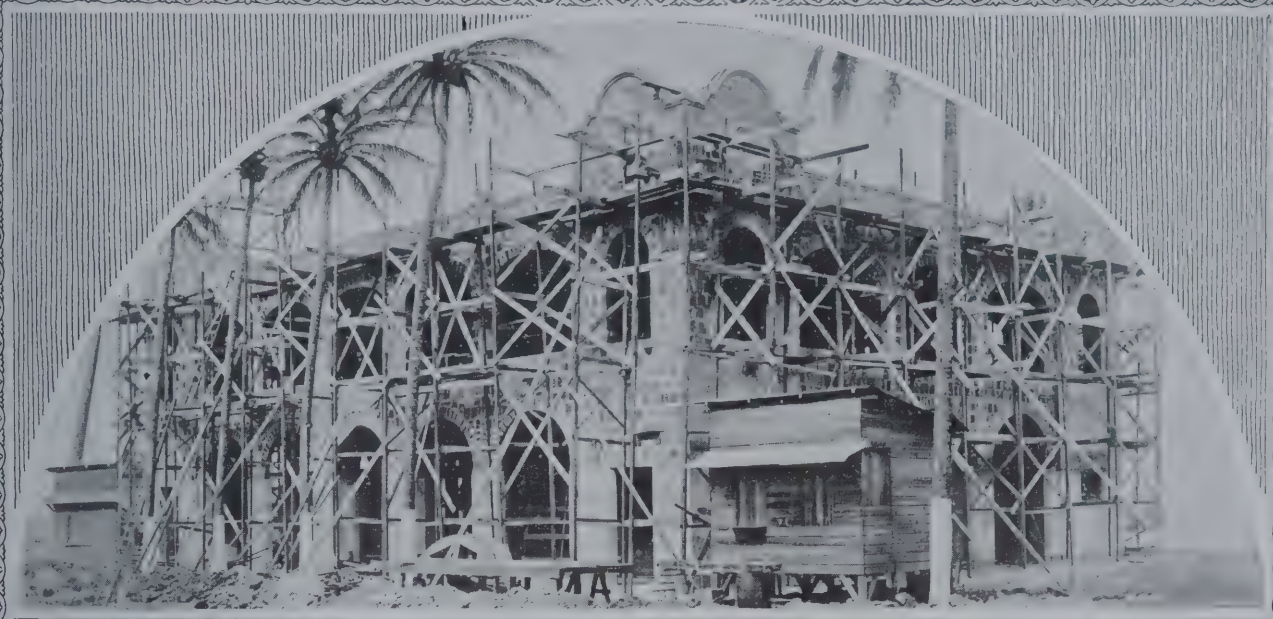
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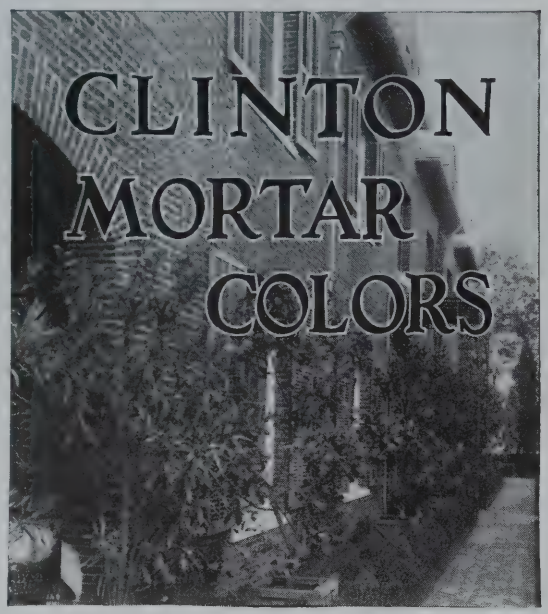
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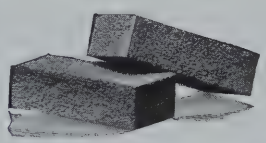
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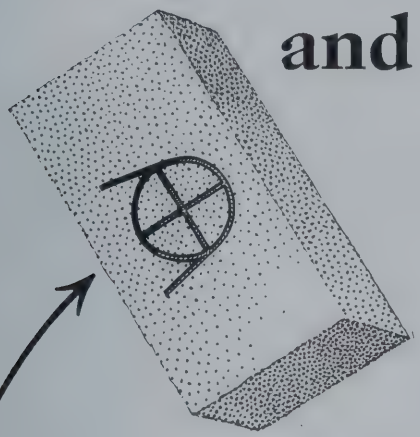
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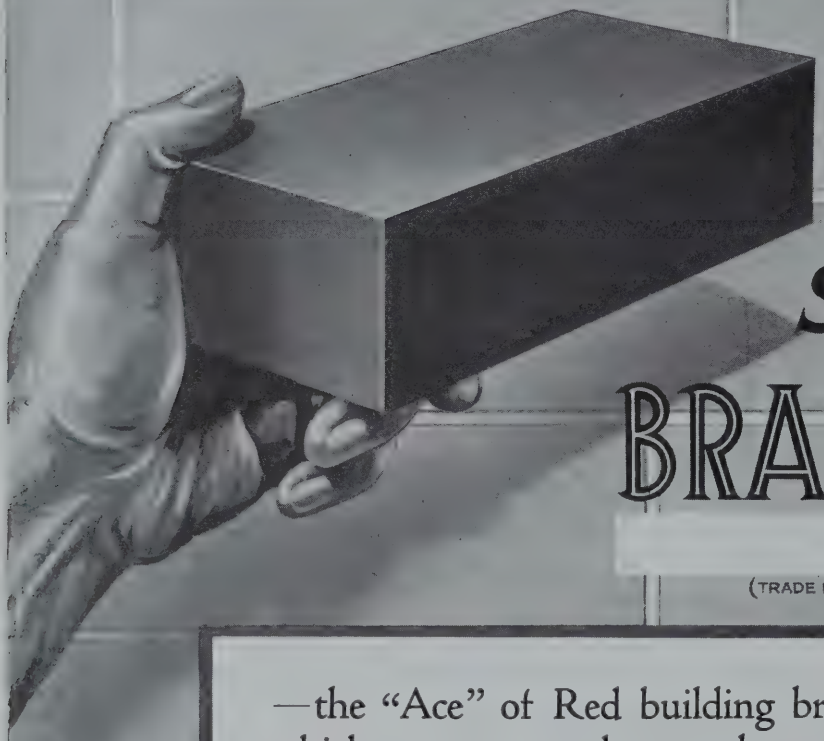


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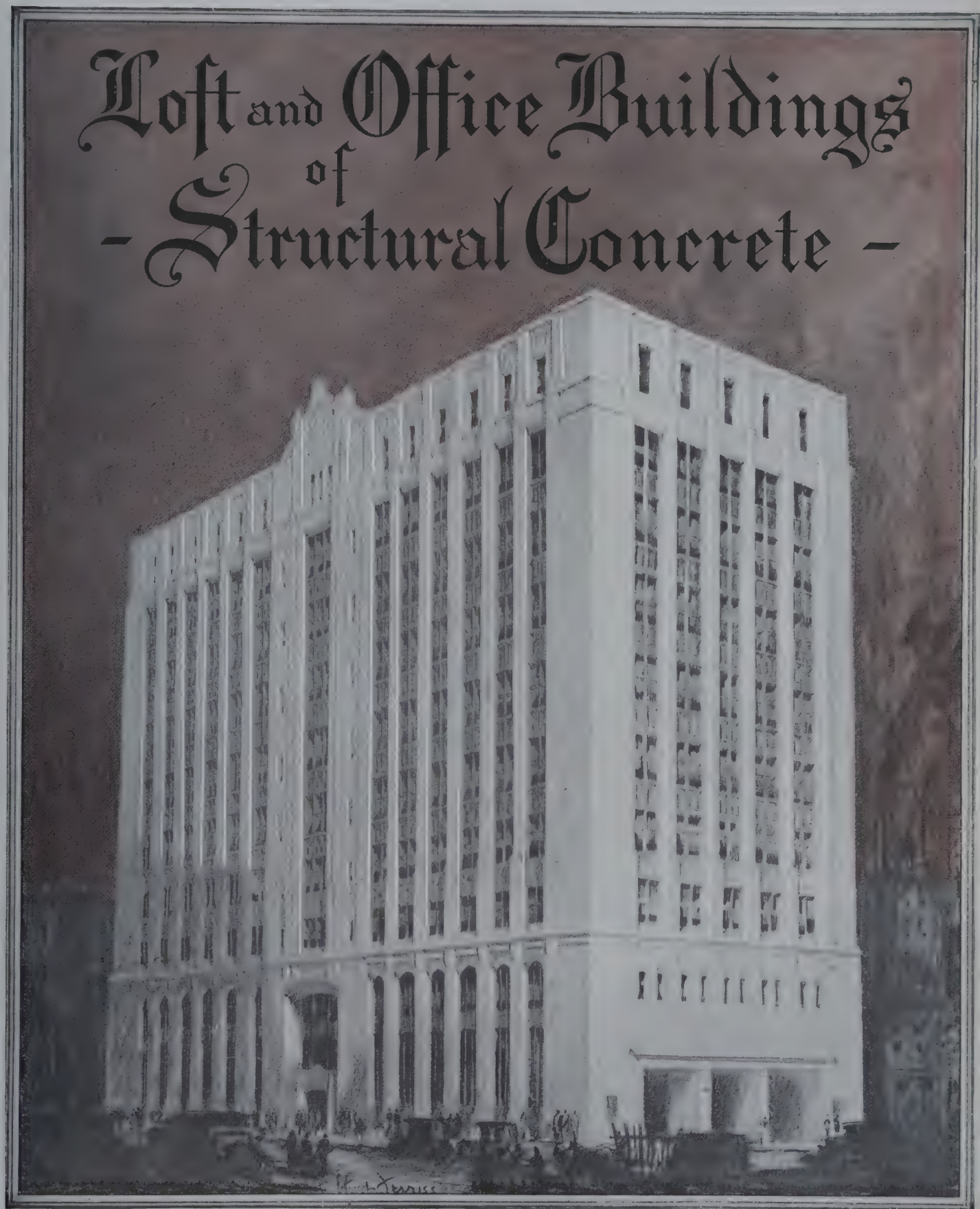
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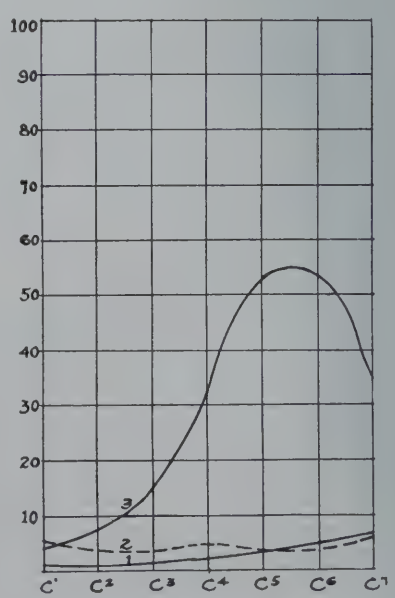


AKOUSTOLITH, a masonry material, has a sound absorbing or acoustical value approximately ten times that of ordinary plaster (see graph) and comparable with felt treatment as usually applied. It can be made in a variety of textures, usually of a fine granular appearance imitating caen stone almost perfectly (see illustration of Chapel in Notre Dame Church, New York) and is made in a wide range of colors —ranging from gray white through various shades of buff, gray, and the stronger blues, etc., if desired.

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AKOUSTOLITH used on ceilings has primarily been installed in connection with our regular Guastavino arch construction, using it as a soffit course of tile and backing up the same with two or more layers of rough tile. It is, however, being largely used applying it directly on the soffit of the concrete floor slabs, or wire lath and cement plaster ceiling.

For side walls the installation can be made directly on any of the many masonry surfaces without scratch coat if surface is reasonably true, or applied on a wire lath backing as described for ceilings.



The above graph shows the variation of absorbing power for reflected sound within the musical pitch.
Curve 1 shows the absorption of unpainted brick surfaces.
Curve 2 shows the absorption of soft plaster and wood lath.
Curve 3 shows the absorption of AKOUSTOLITH sound absorbing stone.

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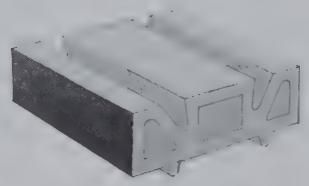
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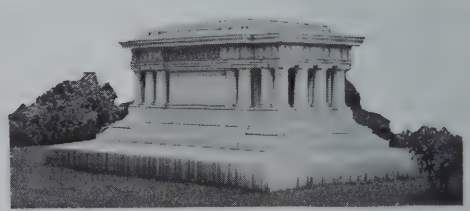
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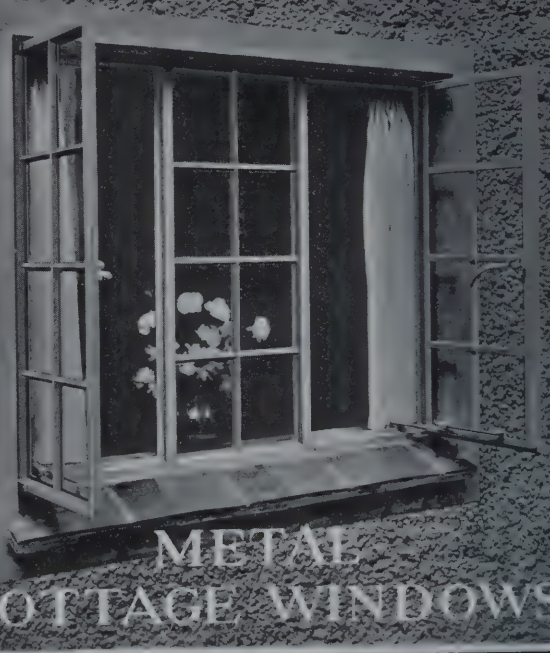


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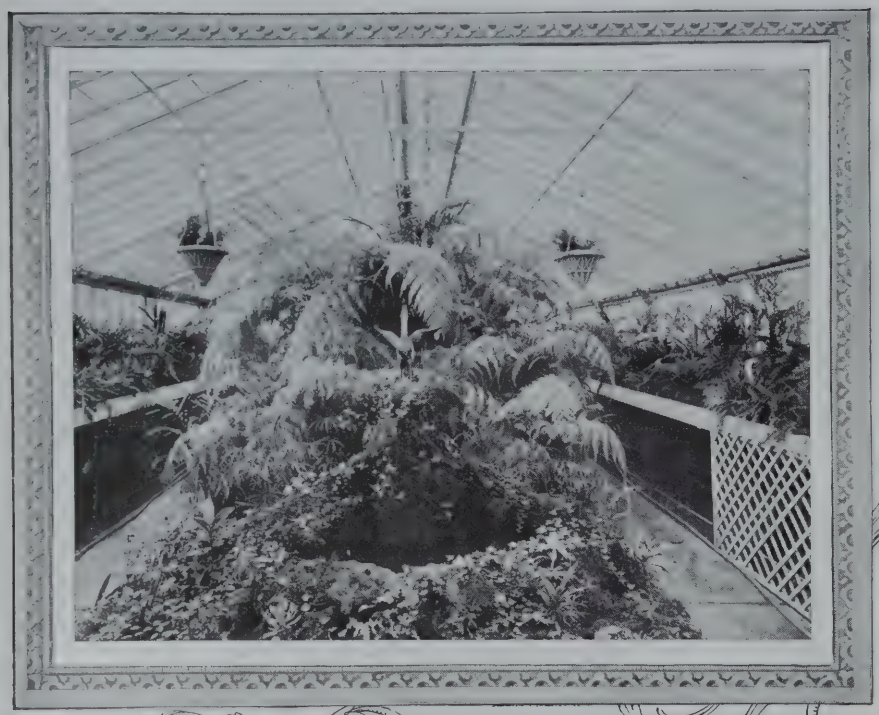
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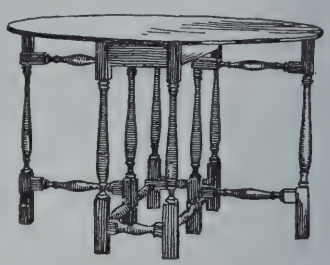
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Canterbury Cathedral—This view is taken from the North Aisle of Choir, of which William of Sens completed four pillars.

French Influence *on* English Gothic Styles

HOW the destruction of a single building can influence a nation's architecture is a fact attested by history; and the Canterbury Cathedral fire in 1174 provided a notable instance.

Hopelessly defaced by this great conflagration the cathedral presented an important problem to rebuilding skill; and William of Sens, a French architect, was invited to England, that he might reconstruct the beauty destroyed. His hand sowed, then, in British architecture, a seed of change which extended to Westminster Abbey itself—a seed whose harvest spread so greatly that, toward the close of the 13th century scarcely a trace of ancient English architectural style maintained itself in England.

French forms had become dominant. Thenceforward, for a space in both countries, the early pointed arch developed into the geometrical style and this in turn to the later decorated style. And France it was always who led the way—a fact clearly illustrated by the choir and transepts of Le Mans Cathedral (1217-1254), the choir of Amiens Cathedral (1244-1288), the choir of Beauvais (1225-1270)—these all being of earlier period than English buildings of corresponding style and undoubtedly influencing them.

In 1338 occurred yet another determiner of architectural change. The Hundred Years' War was ushered in and England's troops, led by their sovereign, Edward Plantagenet, third of his name, invaded France. Now this invasion unquestionably had—through the impressions formed in minds of King and followers—notable reactions upon England's structures. And these impressions were to bear fruit, to quote a single instance, in the Chapel of Saint Stephen in the Palace of Westminster—the magnificent conclusion of which the St. Chapelle of Paris inspired Edward to accomplish.

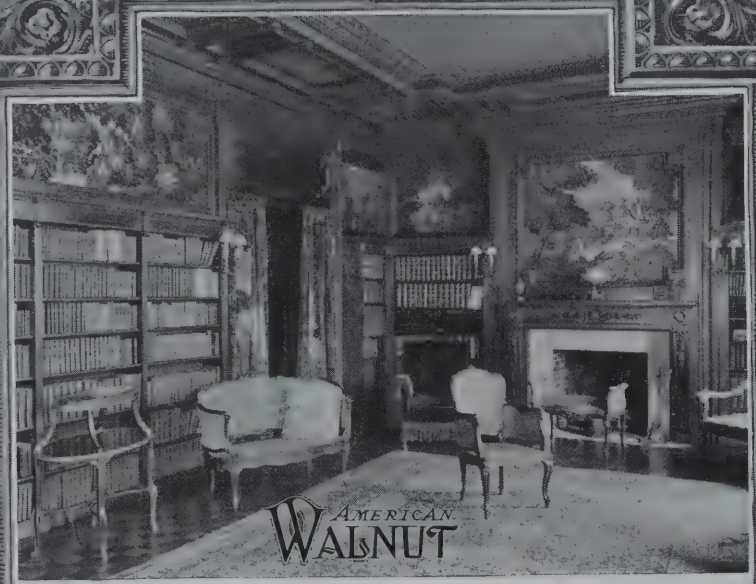
The influence of France has been great upon the arts. In the field of decorative silk today her influence is widely felt; and, nowhere, perhaps, is this more effectively illustrated than in many of the decorative and upholstery silks produced by Cheney Brothers.

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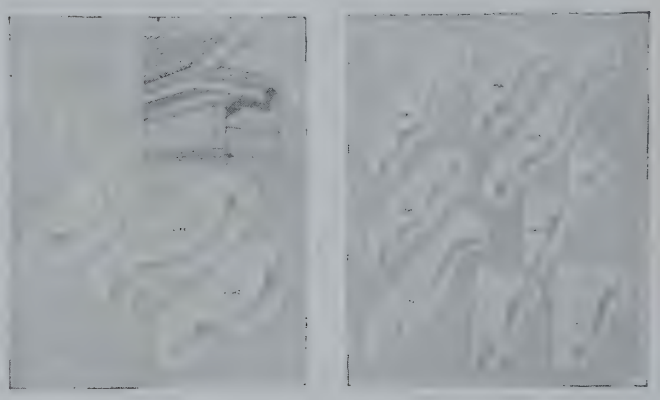
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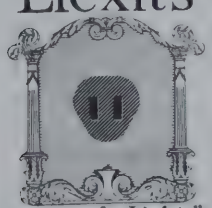
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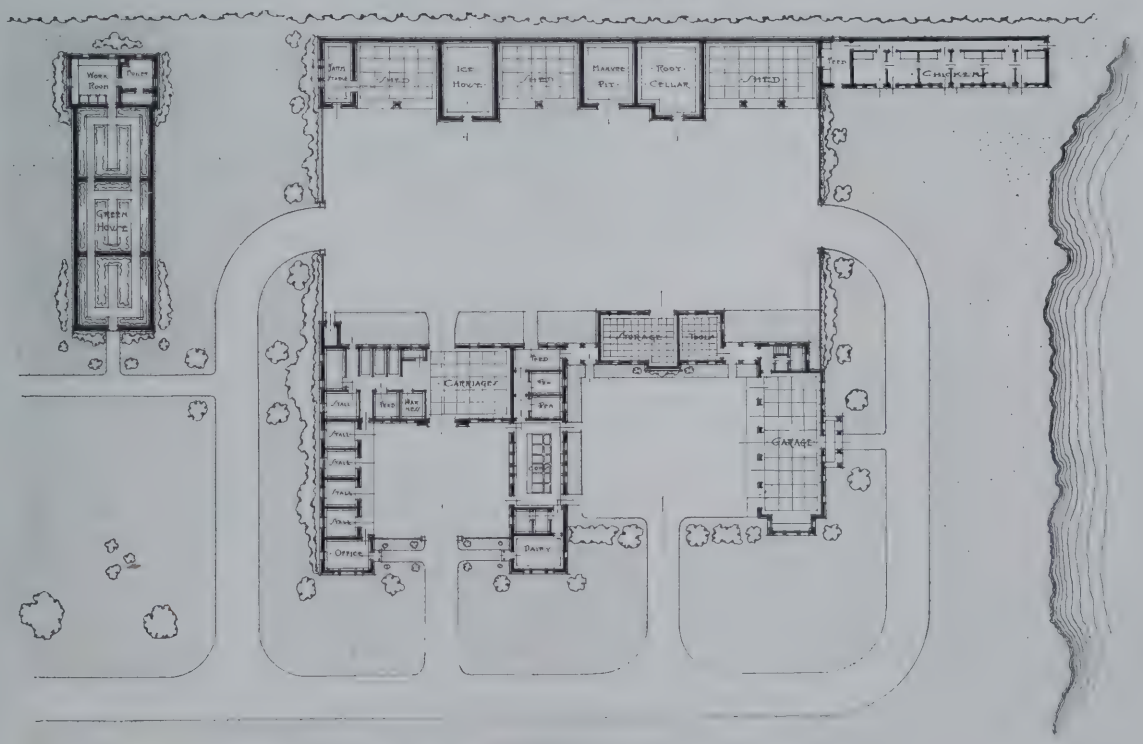
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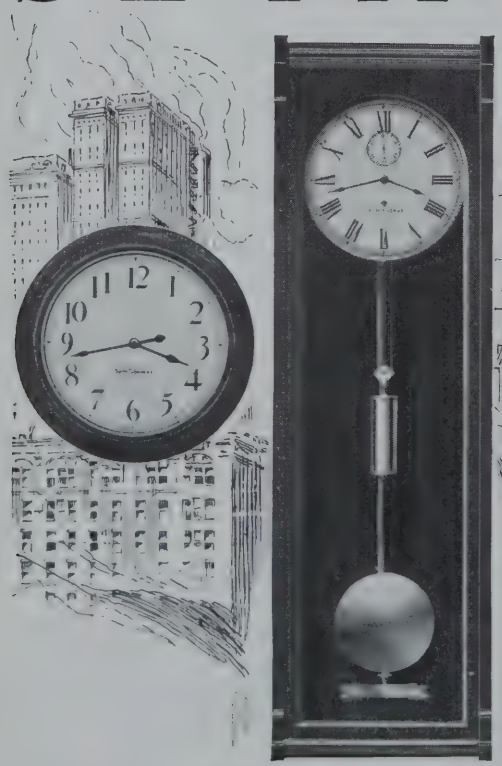
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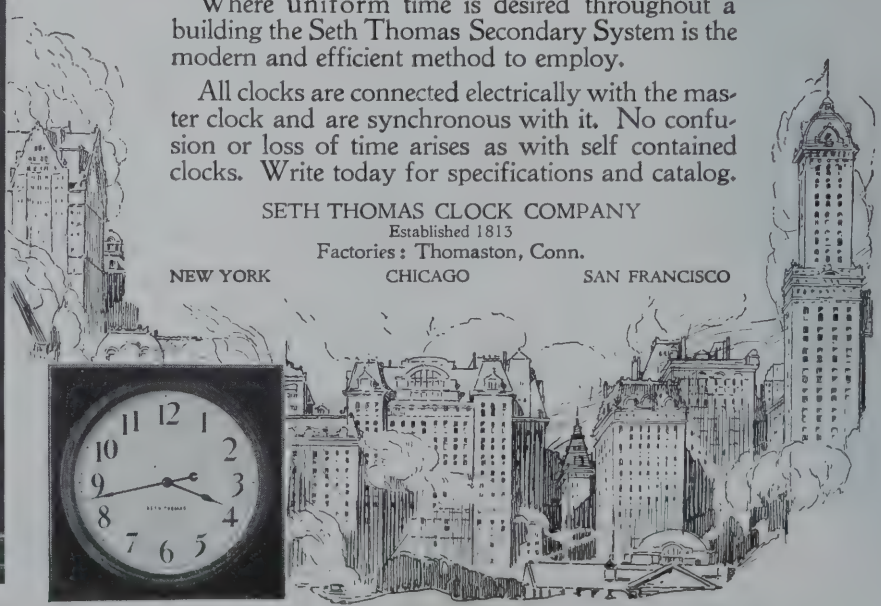
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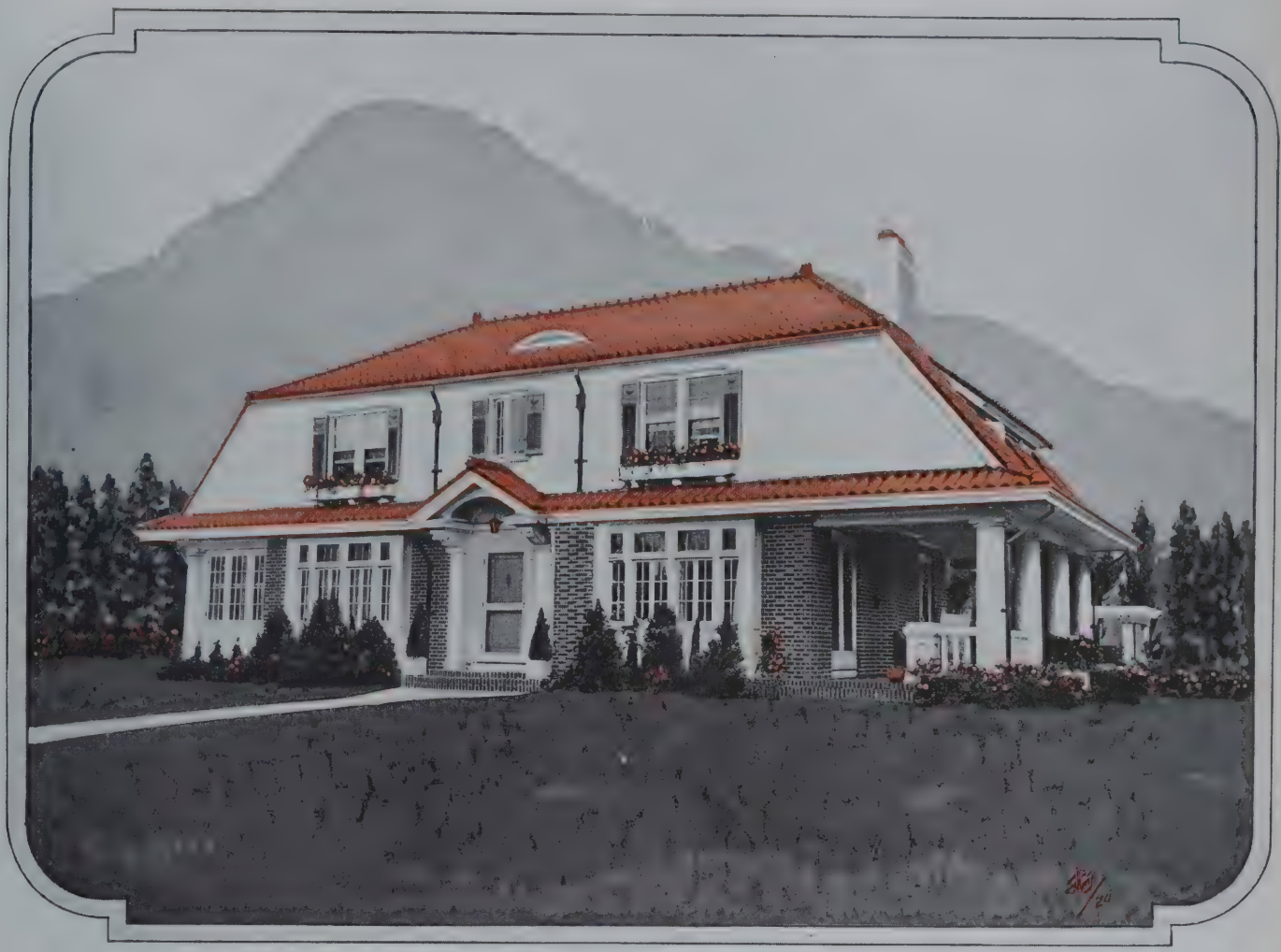


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Twelve rooms: foundation 28x58 feet; two-car garage in rear.

Unharmed by Storm or Stain

This interesting home overlooks Roger Williams Park in the outskirts of Providence. The specifications provided for a base and scratch coat of gray portland cement mortar on Clinton wire cloth. Over this is stucco (dash finish) of Medusa Waterproofed White Cement and light-colored bank sand. The face brick is also laid up with Medusa Waterproofed White Cement mortar.

Some time ago, the City of Providence and vicinity were visited by a terrific hail, rain and wind storm that not only damaged shingle and clapboard houses by splitting and breaking, but beat the finish down to the wood, requiring extensive repairing and repainting. This and other cement-stucco houses nearby, came through without blemish.

Not a single discoloration or "weeping joint" has developed in more than four years' exposure, with the single exception of a slight wash from two window sills in the rear. The architect, Mr. Peirce, who is connected with the City of Providence Department of Public Buildings, has recently built a home for himself, using face brick laid in Medusa Waterproofed White Cement mortar.

Medusa Stainless White Cement not only helps you get the exact effect your plans call for while the building is still new, but assures *permanence* of results. Architects are cordially invited to ask for Medusa Booklets and for information upon specific problems.

THE SANDUSKY CEMENT COMPANY

DEPARTMENT F CLEVELAND, OHIO

"THE MEDUSA REVIEW" *deals with problems of architect, engineer, contractor and dealer and shows interesting applications of cement in building construction. We shall be pleased to enter your name upon request. The subscription is free.*



Detail of fireplace in living room.
Brick laid in Medusa Waterproofed
Stainless White Cement.

MEDUSA Stainless White Cement - *Waterproofed*



WEBSTER HOTEL, CHICAGO
Architect and Engineer, Fridstein & Co., Chicago
Builders, G. H. Gottschalk & Co., Chicago
Masonry Contractor, A. and E. Anderson, Chicago

Specify Carney's Cement—

The Bond That Will Guarantee Your Wall

THE architects who planned the Webster Hotel in Chicago specified Carney's Cement because they knew it would do what they wanted it to do.

They knew that it would become harder than the brick itself—that its unequaled adherence and durability would produce walls of superior quality.

They knew that it would save money in first cost, the labor of using, and in the number of bricks laid per barrel.

"The Bond That Guarantees The Wall"

They knew that its plasticity would make the use of lime unnecessary and that the careless addition of more sand than required would cause the man on the job to send the mortar back to the mortar box—automatic assurance of a perfect mix.

Hundreds of discriminating architects and engineers are ***guaranteeing*** *their walls by specifying "One part Carney's Cement, three parts sand, no lime." You can do the same.*

CARNEY'S CEMENT COMPANY, Mankato, Minn., Cement Makers since 1883

DISTRICT SALES OFFICES:

The Carney's Cement Sales Co.: Leader-News Bldg., Cleveland; Chamber of Commerce Bldg., Chicago; Omaha National Bank Bldg., Omaha; Syndicate Trust Bldg., St. Louis. **Jas. Quinn, Jr.:** Book Bldg., Detroit. **Carney's Cement Co.:** Builders' Exchange, Minneapolis

CARNEY'S CEMENT

For Brick and Tile Mortar



—consequently covers greater area; and insures smooth, even wall surfaces, perfect corners and angles.

See Sweet's Catalog, or write us for detailed specifications. Over four thousand dealers are at your service when you specify TIGER.

THE KELLEY ISLAND LIME & TRANSPORT CO.
World's Largest Producer of Lime
Leader-News Building, CLEVELAND

The floor of Armstrong's Linoleum No. 350 in this interior was carefully planned as a part of the scheme.



The Possibilities of Modern Linoleum Floors

TO THOSE who are familiar with the newer designs, modern linoleum floors and decorative possibilities are synonymous. Striking effects, lacking nothing in refinement, are a matter of selecting one of the many new patterns of Armstrong's Linoleum to harmonize with the scheme. The black-and-white illustrated and the new Inset or Marble Tile designs lend themselves particularly well to the art of the interior decorator.

And these linoleum floors are not only artistic, but are also thoroughly practical in that they are comfortable underfoot, quiet, easily cleaned; and readily laid over concrete in the modern fireproof type of structure. No sleepers are necessary. The linoleum can be firmly cemented over felt paper directly to the concrete base.

Information describing this better method of installing linoleum floors, as well as colorplates of the new 1921 patterns, will be sent, without cost or obligation, on request. A Bureau of Interior Decoration is maintained for your convenience.

Armstrong Cork Company, Linoleum Dept., *Lancaster, Pa.*

Armstrong's Linoleum

for Every Room (A) in the House

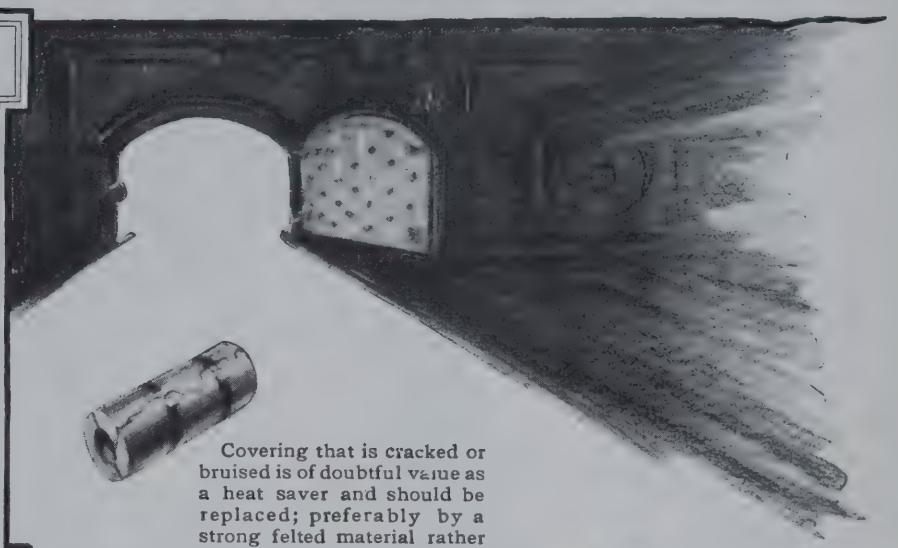
CIRCLE A TRADE MARK REG. U.S. PAT. OFF.

Six ways to tell how your heat is wasted

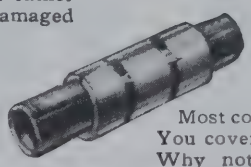
TO encourage fuel Saving we have thought it helpful to show some of the ways that heat is lost or wasted and how such losses can be located.

The common causes for heat loss are not deeply hidden. On the contrary, they are evident to anyone who will look for them.

If you find any one of the conditions below in your system, you can without a doubt be helped by Johns-Manville Insulation Service.



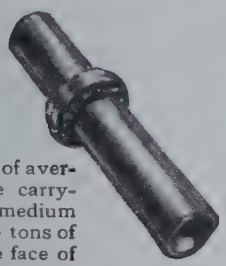
Covering that is cracked or bruised is of doubtful value as a heat saver and should be replaced; preferably by a strong felted material rather than the more easily damaged molded kind.



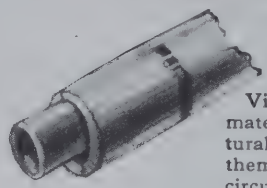
Most coverings are too thin. You cover pipes to save heat. Why not save all that is possible by using proper thickness—instead of accepting the partial saving of thin inadequate materials.



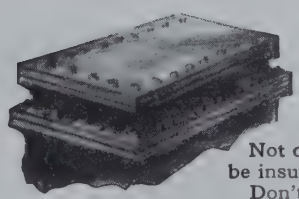
Often, pipes are covered but flanges and fittings left bare. Very wasteful. More fuel is wasted by leaving one pair of flanges bare than if a whole foot of the pipe itself were left uncovered.



Twenty-five feet of average size bare pipe carrying steam at a medium pressure wastes 14 tons of coal a year. In the face of this fact uncovered pipes are inexcusable.



Vibration wears away materials that are structurally weak causing them to sag, allowing circulation of air between covering and pipe, thus reducing their effective thickness and insulating value. Moral: Be sure that the material you use has more than heat-saving value—that it has long life as well—preferably a *felted* rather than a *molded* material.



Not only pipes but every hot surface must be insulated to secure maximum fuel savings. Don't be content with saving heat loss from pipes alone—find every hot surface and have it properly insulated.

Johns-Manville Service Covers This Continent

Through—

Asbestos

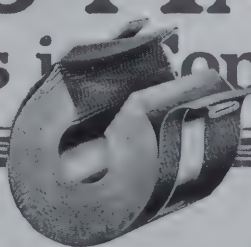
and its allied products

INSULATION *that keeps the heat where it belongs*
CEMENTS *that make boiler walls leak-proof*
ROOFINGS *that cut down fire risks*
PACKINGS *that save power waste*
LININGS *that make brakes safe*
FIRE PREVENTION PRODUCTS

JOHNS-MANVILLE
Serves in Conservation

JOHNS-MANVILLE, Inc.
Madison Avenue, at 41st Street, New York City
10 Factories—Branches in 64 Large Cities
For Canada: CANADIAN JOHNS-MANVILLE CO., Ltd., Toronto

Samples displayed with Architect's Samples Corp. New York City



Asbestocel

For hot water and low pressure steam lines. Note that the corrugations run around the pipe, not along its length. This effects a marked increase in efficiency.



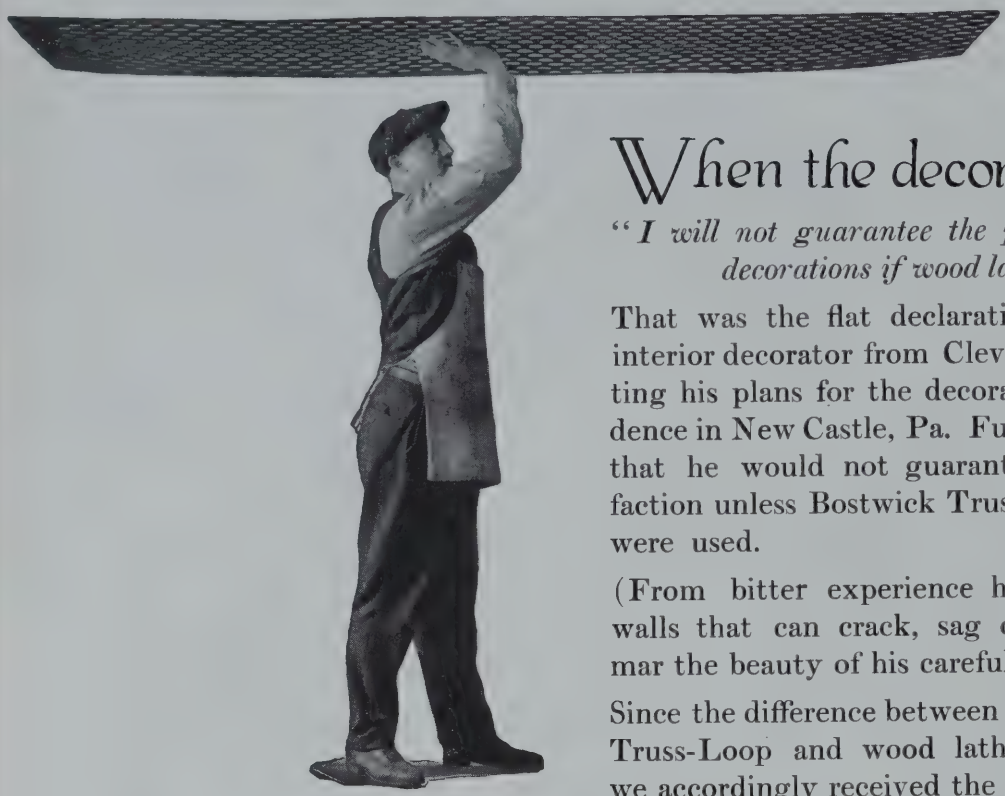
Asbesto-Sponge Felt

The most efficient commercial insulation known, and the most durable, because felted instead of molded, hence most economical.



85% Magnesia

Johns-Manville 85% Magnesia, the most durable and efficient insulation of the molded type.



Walls backed with Bostwick Truss-Loop can't sag or crack because each sheet of Bostwick Truss-Loop is a rigid unit.

When the decorator balked

"I will not guarantee the permanence of these decorations if wood lath is used."

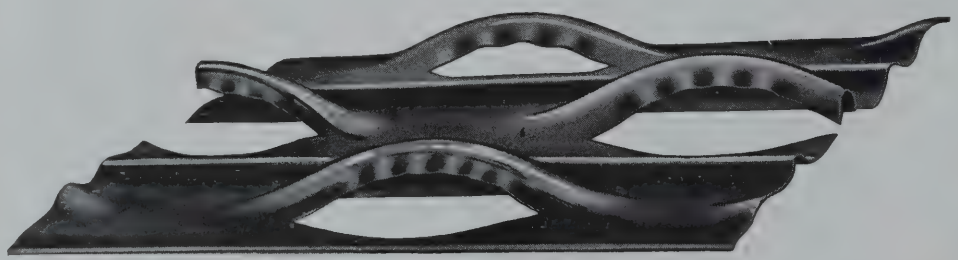
That was the flat declaration of a prominent interior decorator from Cleveland when submitting his plans for the decoration of a fine residence in New Castle, Pa. Furthermore, he stated that he would not guarantee *permanent* satisfaction unless Bostwick Truss-Loop Metal Lath were used.

(From bitter experience he knew how badly walls that can crack, sag or become streaked mar the beauty of his careful designs.)

Since the difference between the cost of Bostwick Truss-Loop and wood lath proved negligible, we accordingly received the order.

The architect who makes a tight specification for Bostwick Truss-Loop Metal Lath and insists that it be used is insuring to his client walls and decorations of lasting beauty.

THE BOSTWICK STEEL LATH CO.
NILES, OHIO



Bostwick

TRUSS-LOOP
METAL LATH

THE ARCHITECTURAL FORUM

VOLUME XXXIV NUMBER 1

CONTENTS for JANUARY 1921

PLATE ILLUSTRATIONS

	Architect	Plate
HOUSE OF MRS. WILLIAM H. BLISS, MONTECITO, CALIF.	*Carleton Monroe Winslow*	1–5
INDUSTRIAL LABORATORY, U. S. BUREAU OF STANDARDS, WASHINGTON, D. C.	*Donn & Deming*	6, 7
U. S. ARMY SUPPLY BASE, BROOKLYN, N. Y.	*Cass Gilbert*	8
THE SCHWINN BUILDING, CHICAGO, ILL.	*Walter W. Ahlschlager*	9
BUILDINGS FOR JACKSON MILLS, NASHUA, N. H.	*Lockwood, Greene & Co., Engineers*	10, 11
ELEMENTARY SCHOOL FOR U. S. HOUSING CORPORATION, QUINCY, MASS.	*McLaughlin & Burr*	12, 13
OFFICE BUILDING OF THE NEW ENGLAND POWER CO., WORCESTER, MASS.	*John Barnard*	14
BRANCH FIRE STATION FOR THE CITY OF SALEM, MASS.	*Frank S. Whearty*	15
HOUSE OF PHILIP P. BARBER, ESQ., TENAFLY, N. J.	*R. C. Hunter & Bro.*	16

LETTERPRESS

	Author	Page
COVER DESIGN, VILLA BABLIANELLO ON LAKE COMO, ITALY. Drawn by O. R. Eggers		
THE EDITORS' FORUM		43
CHURCH OF OUR LADY OF POMPEII, NEW YORK. From Pencil Drawing by Harold R. Shurtleff	*Frontispiece*	
VILLAS OF THE VENETO. I. The Villa Emo at Fanzolo	*Harold Donaldson Eberlein and Robert B. C. M. Carrere*	1
"CASA DORINDA," A CALIFORNIA COUNTRY HOUSE	*Carleton Monroe Winslow, Architect*	9
ARCHITECTURAL EXPRESSION IN CONCRETE	*Frank J. Helmle*	11
DECORATION AND FURNITURE DEPARTMENT	*Jeanne Taylor, Leland W. Lyon, R. A. Associate Editors*	17
The Architect's Control of Furniture and Decoration		
MINOR ARCHITECTURE DEPARTMENT		21
A Remodeled Country House, Lucian E. Smith, Architect		
An Efficient School of Economical Type, McLaughlin & Burr, Architects		
DEPARTMENT OF ENGINEERING	*Charles A. Whittemore, Associate Editor*	25
A Large Concrete Warehouse, R. E. Brigham		
Truss Design and Details, Part III, Charles L. Shedd, C.E.		
BUSINESS AND FINANCE DEPARTMENT	*C. Stanley Taylor, Associate Editor*	31
Business Elements in an Architect's Office		
TWO DETAILS FROM THE COTSWOLD DISTRICT, ENGLAND		36
PLATE DESCRIPTION		37
EDITORIAL COMMENT. What Does 1921 Hold for Architects?		38

ALBERT J. MacDONALD, Editor

Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada ..... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies ..... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.
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The editorial and general offices of
ROGERS AND MANSON COMPANY, Publishers
are now located at 142 Berkeley Street, Boston 17, Mass.

THE DOVETAILED KEY INTERLOCKS THE PLASTER
BISHOPRIC STUCCO AND PLASTER BASE
TRADE MARK REGISTERED

BISHOPRIC SUGGESTIONS:

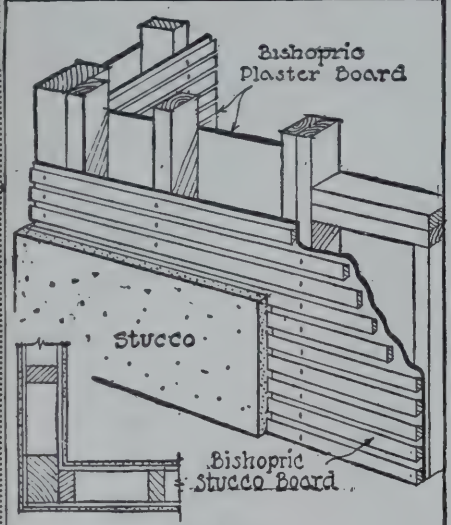
Showing use and application of Bishopric Stucco Base for Exterior Wall Conditions.

"For details and specifications see Fifteenth Edition Sweet's Catalogue pages 353-369, inclusive."

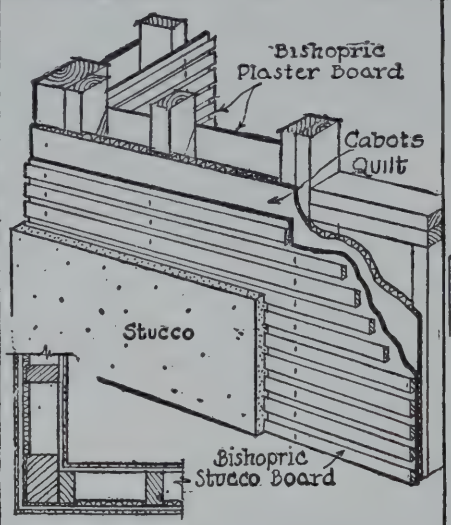
THE BISHOPRIC MANUFACTURING CO., 103 Este Avenue, Cincinnati, O.

BISHOPRIC SHEATHING—Strengthening, insulating, sound-deadening, weather-proofing unit; for exterior walls, sub-flooring and sub-roofing.

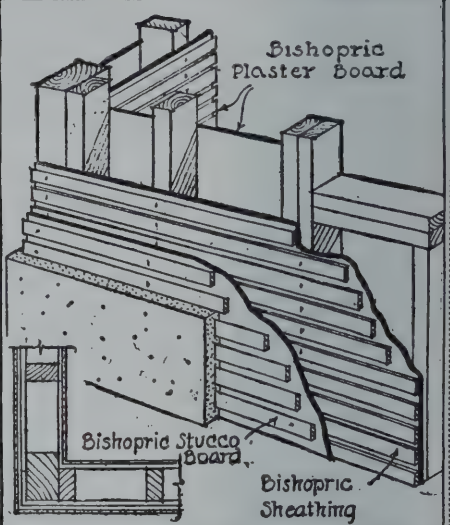
BISHOPRIC STUCCO AND PLASTER BASE—Interlocking dovetailed key, insulating and waterproofing unit; creosote treated and not treated.



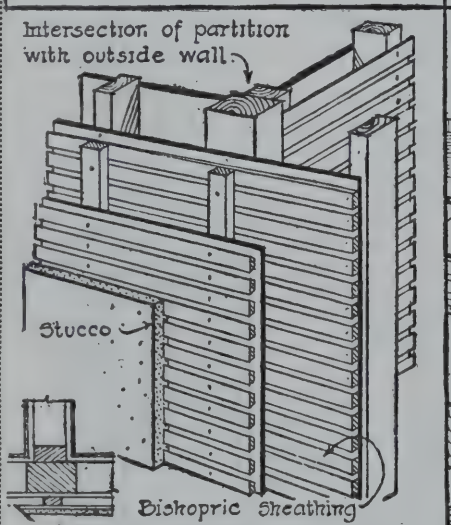
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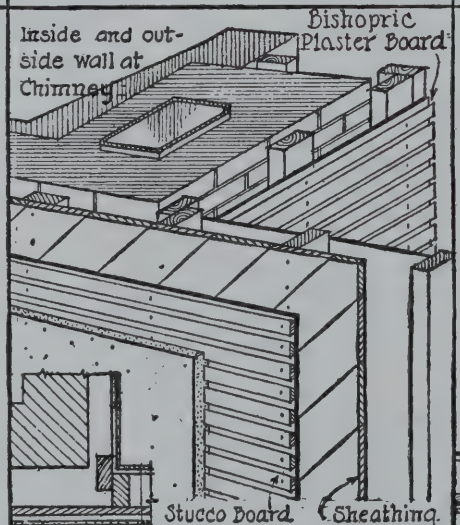
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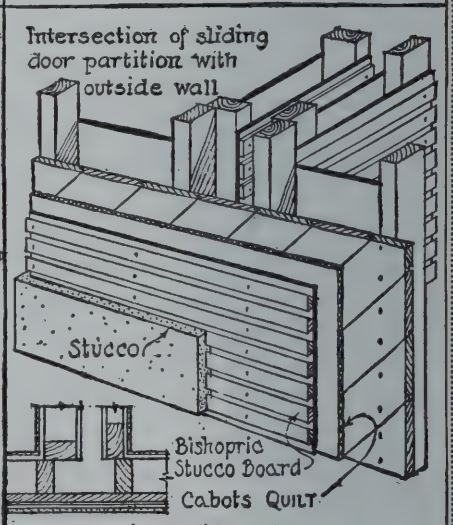
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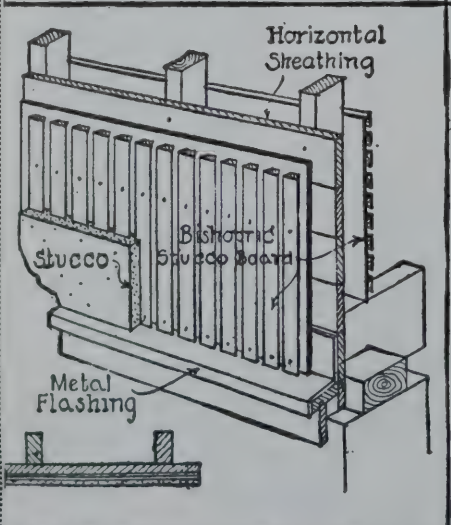
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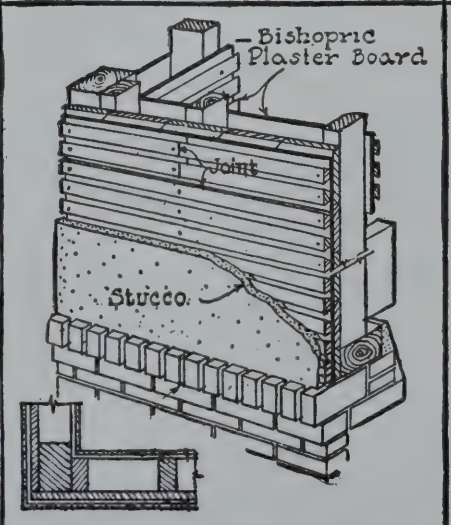
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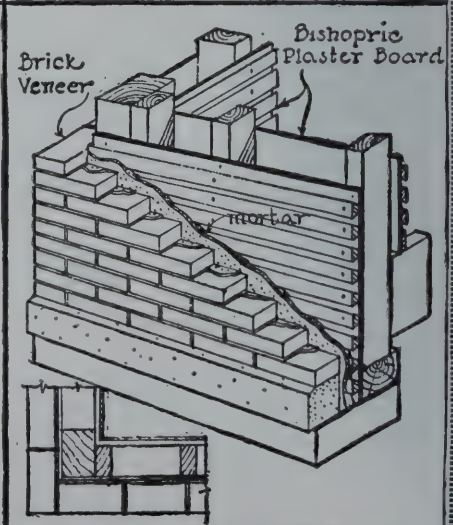
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APPLIED · WITH : BROKEN · JOINTS



APPLIED · WITH · BRICK : VENEER

THE EDITOR'S FORUM

The Architectural Forum for 1921

THE year 1921 is confidently expected to witness the resumption of normal building activities. It will, we hope, hold great opportunity for the progress and development of American architecture after the serious interruption of the world war.

Conditions that will surround the practice of architecture in this new era, it is fair to believe from evidence at hand, will differ in many respects from those obtaining in past years. In the first place, the standard of performance demanded of the architect is higher now than at any previous time; he is expected to produce buildings of great architectural character, to plan in such a capable manner that every possible convenience will be afforded, and above all he is expected to produce these results on a rigid economic basis. His building must be accomplished with economical construction methods; he must be able to select from a vast number of materials and types of construction those that will best suit particular conditions and have his choice stand the closest scrutiny.

Thus the complexity of the profession's work increases from year to year. It necessitates the closest attention of architects to the progress that is being made almost daily in the various branches of the building industry.

It is to aid seriously in providing accurate and dependable information that the efforts of the editors of THE FORUM will be devoted in 1921. Our own obligations grow with those of the profession and while we have always conscientiously served the architect to the best of our ability we pledge ourselves to extend our efforts wherever possible in this period of development. THE FORUM aims to perform a useful function in the architect's office. It recognizes the various divisions of architectural work and endeavors to furnish data that will be found of definite value not alone to the designer, but to the construction expert, the specification writer, the executive who must confer with clients on business problems, and the drafting room where efficiency is necessary both to good architecture and adequate profits.

This number is indicative of the service THE FORUM will render its subscribers in 1921. A new arrangement of the plates will be noted; this we feel will make for greater enjoyment in reading inasmuch as the illustrations and related text are brought together. The plates will furthermore be selected to cover in the course of the year all the principal types of buildings architects design; the subjects will also be chosen so that a large portion will come under the classification of moderate cost work. The guiding factor in our selection will be, as always, architectural quality.

Articles on Design

FOR the designer we have in preparation some of the most interesting material ever presented in an architectural publication; a series of monographs on the smaller and more interesting Palladian villas of the Veneto will appear at intervals, providing a source of inspiration of value for domestic work of imposing order and what is perhaps a wider application—institutional and minor public buildings. Our treatment of colonial work which is recognized as a FORUM feature will be continued as well.

An interesting series of illustrated articles on Mexican architecture is in preparation; some of the most valuable and interesting detail plates from the standpoint of architectural inspiration and draftsmanship that have been prepared by Howard Moise from actual measurements of old work in England, France and Italy will be published.

Other articles of undoubted value will indicate successful handling of design for execution in materials and by methods of construction that are in process of development and as applied particularly to industrial and mercantile building.

Allied Technical Subjects

THE special phases of architectural practice embraced in engineering and construction, business and finance, will be continued in regular monthly departments, the subject matter being carefully prepared by qualified experts to meet the needs of the average architectural office. One of the most gratifying things of the past has been the wide interest manifested by architects in our articles relating to the financing of building construction and the promotion of building enterprises. This response has prompted us to provide additional opportunities for giving direct service to our subscribers in specialized fields such as this for which they frequently have need.

A Consultation Committee

WE have fortunately been able to arrange with a number of men who are widely known as experts in their respective fields to serve as members of a Consultation Committee to which questions coming from subscribers may be submitted for reply. The many occasions in practice today when need for information arises that cannot be supplied through the usual office organization make a central agency where advice may be obtained of definite value. THE FORUM we want thought of in architects' offices as more than an architectural magazine—it can and should be of direct and constant service to its subscribers and we invite you to so regard it.





Brewer Building, Boston, Mass. Architects: Densmore & Le Clair, Boston. Contractors: George A. Fuller Co., Boston. Linoleum laid by C. C. Bailey Co., Boston.

Better Office Floors—

Ten stories of light, airy offices in the Brewer Building, Boston. And 10,000 yards of the floor in this thoroughly up-to-date building are covered with *Gold-Seal* Battleship Linoleum.

For the Workers

A rich brown expanse of floor, warm in winter, cool in summer, quiet at all times. Springy resilience and comfort underfoot. The nightly task of cleaning is easy—in the morning a spotless floor, business-like, beyond reproach. No dust germs on the surface and none in the air. Everywhere a healthful cleanliness because *the floor is sanitary.*

And for the Owner

The 100% efficiency of a *guaranteed* floor—every yard protected by the Gold Seal money-back pledge of satisfaction.

The U.S. Navy Specifications ought to satisfy the durability requirement in *any* floor-covering. But *Gold-Seal* Battleship Linoleum more than meets these requirements; that is why it easily withstands the heaviest wear and tear in offices, corridors and halls—wherever traffic is severe.

Gold-Seal Cork Carpet

Gold-Seal Cork Carpet gives cushioned quiet and luxurious tone to the floors it covers. Different shades of rich brown, green and terra cotta (ten in all) offer greater latitude in furnishing those rooms where a particular color-scheme and an absolutely silent floor are desired. Durability and your satisfaction are assured by the iron-clad Gold Seal Guarantee.

Our staff of floor-covering experts is at your service at all times. Specifications for laying and samples sent on request.

Congoleum Company
INCORPORATED

PHILADELPHIA NEW YORK CHICAGO BOSTON
SAN FRANCISCO CLEVELAND MINNEAPOLIS DALLAS
KANSAS CITY MONTREAL

GOLD SEAL
Battleship Linoleum

(THE FAMOUS FARR & BAILEY BRAND)

Made According to U.S. Navy Standard

On every roll of Gold-Seal Battleship Linoleum will be found our Gold Seal bearing this definite pledge—"Satisfaction guaranteed or your money back."



Douglas Fir
Northern White Pine
Idaho White Pine
Western Soft Pine

Western Hemlock
Washington Red Cedar
Red Fir and Larch
Norway Pine

HOW EXPERT SELECTION OF LUMBER MAY SAVE YOU MONEY

EVERYONE admires the fine old wood structures that have come down from Colonial times.

"But," you hear people say, "You can't get lumber like that these days."

It's not the fault of the lumber. It's the way lumber is used.

Use the *right wood* in its *proper place*—and, granted that your construction is right, you will get as sound and durable a building as any built in Colonial days!

There is today available in most markets a greater variety of structural woods than ever—with the possible exception of hardwoods, which are now seldom used for building purposes.

This same thing is true of woods for industrial uses.

Many woods formerly sold only in local markets are seeking wider outlets of distribution. For instance, Douglas Fir, probably the greatest wood in the country for structural timbers, has only recently come into common use in the great markets on the Atlantic Seaboard.

There is available a great body of detailed and scientific knowledge about the qualities of these woods, their strengths, their proper treatment and application, and how they will act under given conditions of service.

Getting this knowledge and acting on it may easily double the service you get from lumber.

You cannot judge the service of lumber by its appearance. The "nice clear board" that looks so attractive may not be the right species for your purpose. A sound board of another species, even though knotted, may give you much greater value and service.

It all depends on the natural characteristics of the wood, and on the careful selection of the lumber for the service it is to perform.

Which is the most practical wood for a given purpose, and what grade will do the work most economically, can all be told by the scientific knowledge about woods which has accumulated through years of observation and experience.

The user of lumber is today in position to fill his requirements more efficiently and economically than ever before.

What we advocate is conservation and economy through the use of the right wood in its proper place.

To this end we will supply to lumber dealers and to the public, any desired information as to the qualities of the different species and the best wood for a given purpose.

This service will be as broad and impartial as we know how to make it. We are not partisans of any particular species of wood. We advise the best lumber for the purpose, whether we handle it or not.

From now on the Weyerhaeuser Forest Products trade-mark will be plainly stamped on our product.

When you buy lumber for any purpose, no matter how much or how little, you can look at the mark and know that you are getting a standard article of known merit.

Weyerhaeuser Forest Products are distributed through the established trade channels by the Weyerhaeuser Sales Company, Spokane, Washington, with branch offices and representatives throughout the country.

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